

CANADIAN GEOGRAPHICAL JOURNAL

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PERIODICAL
READING ROOM

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Dept. of Agriculture photograph

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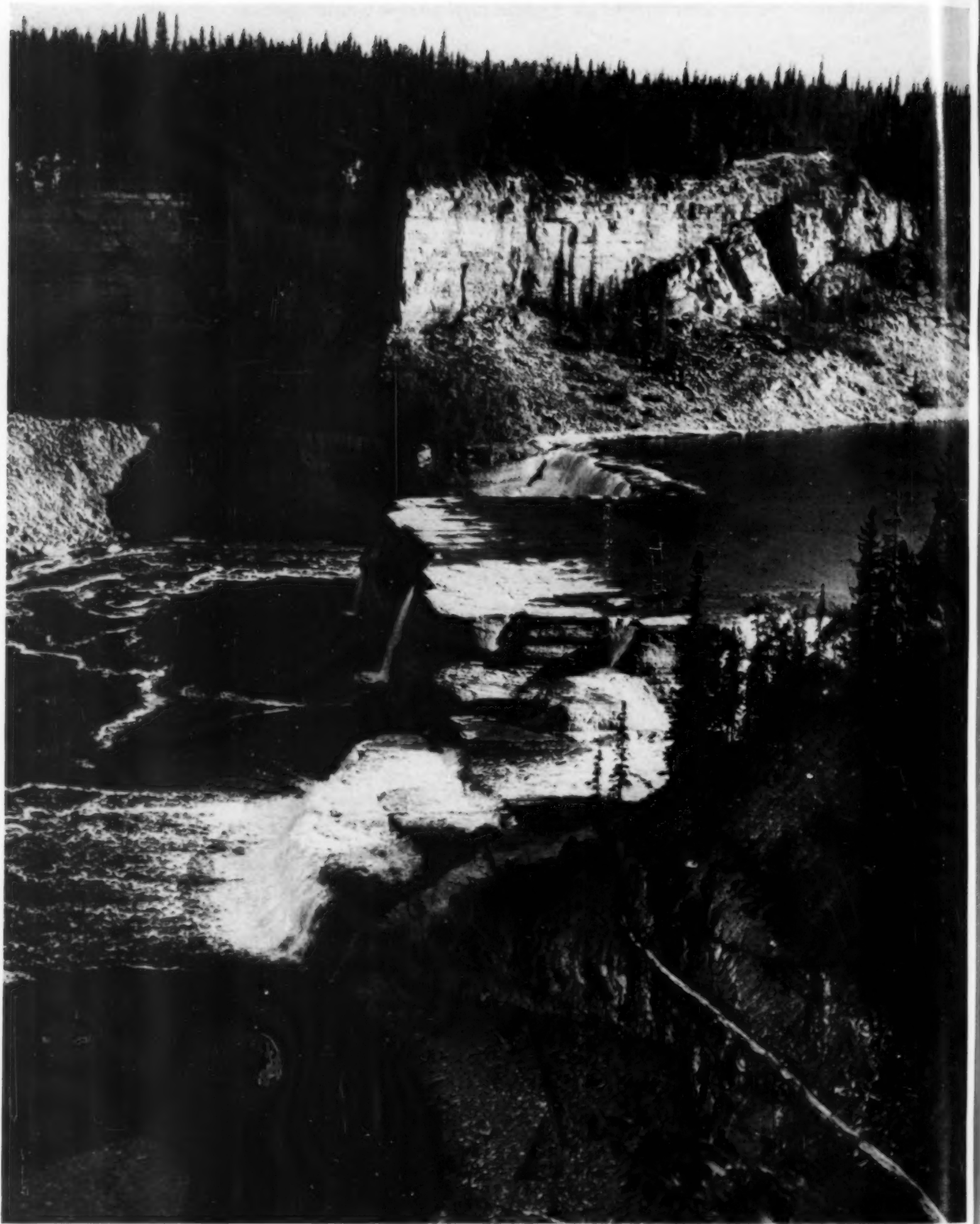
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The cascading waters of Louise Falls on the Hay River about thirty-six miles south of Great Slave Lake. The falls have a drop of about sixty-five feet.



View of historic Hay River which parallels the Mackenzie Highway for over one hundred miles.

The Mackenzie Highway Leads Down North

by LYN HARRINGTON

Photographs by RICHARD HARRINGTON

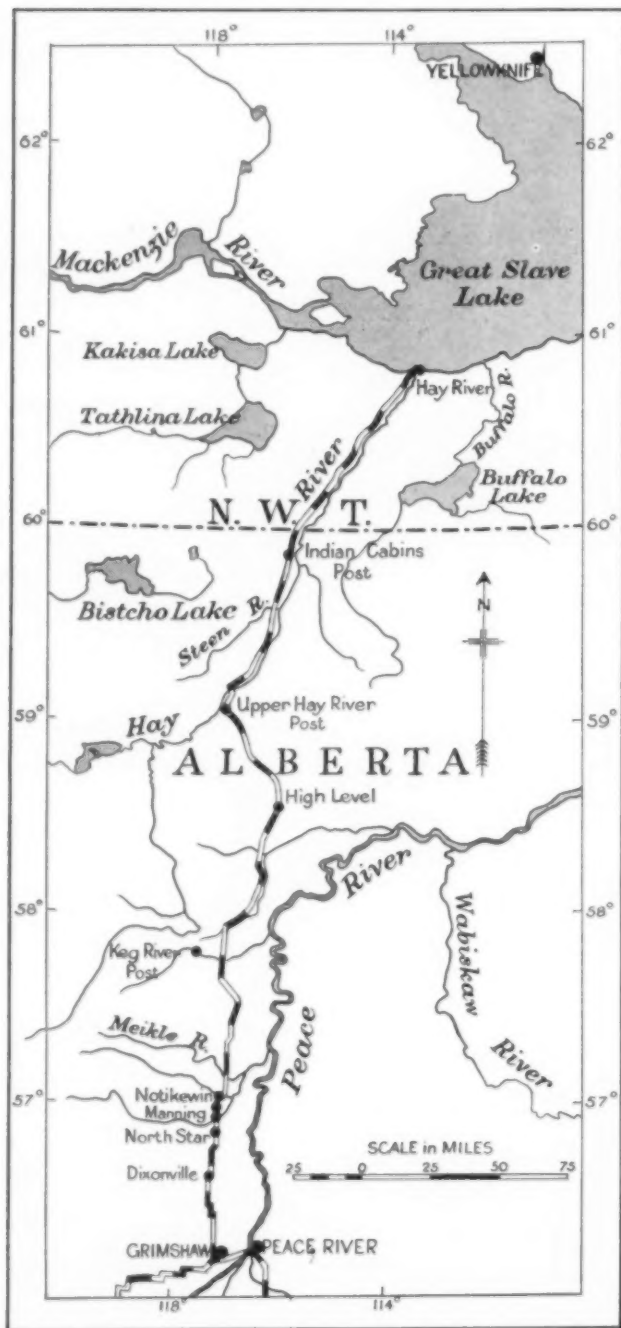
FREIGHT-LADEN barges still wend their slow way down the Slave River to the ports on Great Slave Lake and points on the Mackenzie River below. But the 390-mile highway through Alberta and the Northwest Territories has brought changes since its completion in 1949. Most provisions are now transported by trucks shuttling up and down the Mackenzie Highway, the supply lifeline of gold-mining Yellowknife.

Trucks, running in all seasons, also have replaced the slow tractor-trains that rumbled northward over the snow and frozen lakes each

winter. The highway follows that tractor route in part, and green overgrown aisles mark the old trail. New towns have grown up along the highway and old ones have moved in closer. Small businesses flourish to cater to travellers and settlers. With the road, too, came increased development of the country—the opening of new farming areas because produce could reach market readily.

Trucks that carry supplies* to Hay River on the south shore of Great Slave Lake are sure of a return load of fish or oil, the latter brought

*One of the most important supplies carried today is alkylate, an ingredient of aviation gasoline, consigned to Norman Wells and Yellowknife to meet the demands of the "DEW" line.



C.G.J. map

by barge up the Mackenzie River from Norman Wells. In Great Slave about seven million pounds of lake trout and whitefish are caught yearly, nearly half through the ice in winter. Lake trout may weigh as much as sixty pounds, but none over twenty-five pounds are shipped

out. Usually the fish are cleaned on the lake (often at an island filleting plant), boxed in ice, and brought to Hay River by speedy boat. More crushed ice is added, lids are nailed down, and the boxes of fresh fish are rushed south to the railroad at Grimshaw.

The Mackenzie Highway starts at Grimshaw, fifteen miles west of Peace River, a bustling centre for Alberta wheat farmers, beef ranchers, oil drillers and transport crews. From here the road streaks north, and at Mile 308 crosses the border into Mackenzie District. From there it parallels the Hay River for eighty-two miles to the trading post and lake port at its mouth.

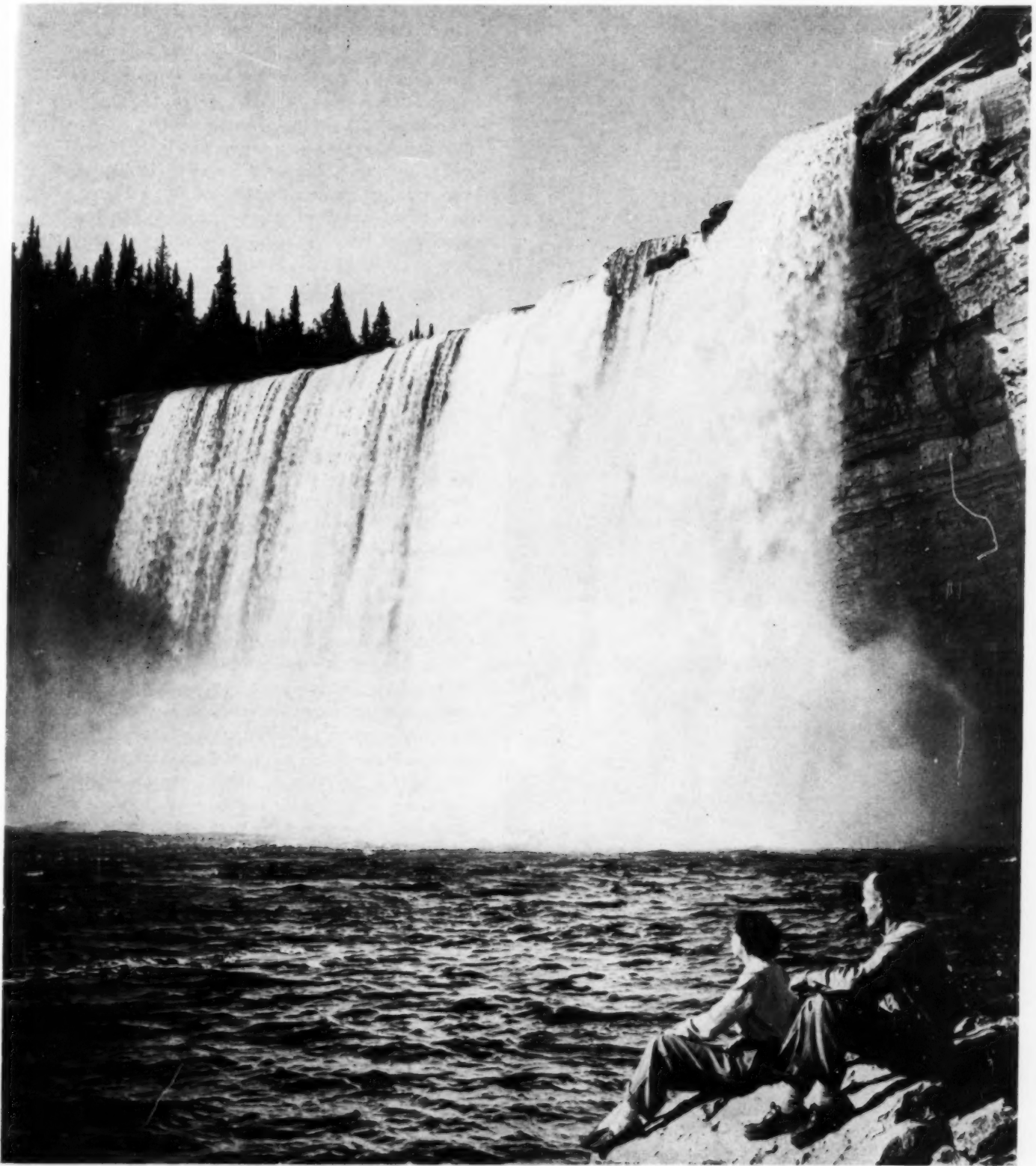
From the highway, short roads fan out into the farming blocks, for many settlers reached this country by steamer and took up homesteads along the river banks. Most settlement lies away from the road, so that the impression of a lonely land is modified only by a detour to one side or other.

Battle River Valley, extremely wide and cut by low ranges of hills, is the largest area of fertile farming land in the region. Wide skies arch dramatically over the black earth and over the former First, Second and Third Battle Rivers, now renamed Notikewin, Hotchkiss and Meikle. The vigorous young town of Manning, named for Alberta's popular premier grew up with the highway, a farmers' town in the new north, attractively located by the Notikewin.

Notikewin ("battle" in the Indian language) was the scene of a spectacular rout of 500 invading Crees. From Lesser Slave Lake, the painted warriors crossed the Smoky and Peace Rivers, striking north to obliterate the Beaver tribe. A few Beaver Indians fled ahead to give the warning. Near the Notikewin River, the Crees crept forward hidden by breast-high grass, unaware that the grass across the river concealed crouching Beavers even more effectively. The battle opened with a hail of

Right:—Alexandra Falls on the Hay River, plunging over limestone cliffs 106 feet high, and veiling the caverns behind it.

THE MACKENZIE HIGHWAY





arrows. Then some Beaver braves swam the river, carrying flints. The tall dry grass roared into flame and billowing smoke, and very few Crees escaped death on the blazing prairie.

At High Level, Mile 180, a gravelled side-road leads east through Indian reserves to historic Fort Vermilion on the Peace River. Trapping is no longer the main source of livelihood, and seas of grain wave where brush-cutters have shorn the land of poplar forest. The Experimental Farm there has demonstrated what can be accomplished in this land of long sunlight, both in crops and livestock.

Another sixty-mile road to the west links the trading post of Hay Lake with the Upper Hay River post. A small settlement has collected at the highway junction, but the real community is beside the river, complete with log cabins, church and schools. There the Beaver Indians have camped since time immemorial. From across the shallow river come the tinkle of horse-bells, the shouts of wading children and the howl of huskies tethered beyond the brush tepees and canvas tents. Covered wagons stand on the flats, and blue smoke curls upward from camp-fires.

There is little to catch the eye as the highway leads down north, except the repetitious "base line" signposts. Near the sluggish Steen River, trailer camps have been set up to house oil exploration crews. Indian Cabins Post is the last settlement in Alberta, and consists only of a small sawmill and a row of log cabins. At the far end of the village, almost overgrown by saplings, is a small cemetery of brilliantly painted grave-houses. A pathetic sight is the

Top left:—Dr. Mary Jackson of Keg River uses a stethoscope on a Metis child from Paddle Prairie, near Grimshaw, Alberta.

Left:—Freshwater fishing is the mainstay of those living in the town of Hay River. The girls display necklaces of gill-net floats.

small coffin of a child, wedged high between two poplars.

The most picturesque scenery along the highway is about thirty-five miles south of its terminus, where the Hay River plunges over limestone cliffs. A charming small park gives a view over Alexandra Falls, a golden film 106 feet high veiling the caverns behind it. A mile downriver is pretty Louise Falls, only sixty-five feet high, but cascading over several planes, so that it resembles a modernistic stage setting.

Hay River, long a trading post, was located on the mainland at the mouth of the river. During the Second World War the low scrub on an island in the delta was cleared away to make a landing field for heavy transport planes. The town has since been established on the site, although the ground's tendency to muskeg becomes more apparent as the permafrost melts. Canoes and other vessels are forever on the move between government and business offices in New Town and the missions and hospital in the Old.

The various river channels offer safe havens to the fishing fleet and to the barges which still ply the waters of Great Slave Lake and carry most of the supplies to Yellowknife on the north shore. There is no longer a passenger ferry service between the two ports. People usually travel by aeroplane to Yellowknife.

In order to bring a truck or car to the gold-mining town, motorists usually wait until the ice freezes thickly enough, then drive the 150 miles on the frozen surface. (During the summer cars and trucks are transported by tug and barge between Hay River and Yellowknife.) The ice also serves as a limitless highway for about fifty snowmobiles that scuttle between fishing huts in winter. Cracks up to eight feet wide scarcely worry the drivers, who take a running leap at them and carry planks for emergencies. Last winter, however, a private trucking concern operated a winter toll road from the end of the highway to Yellowknife.

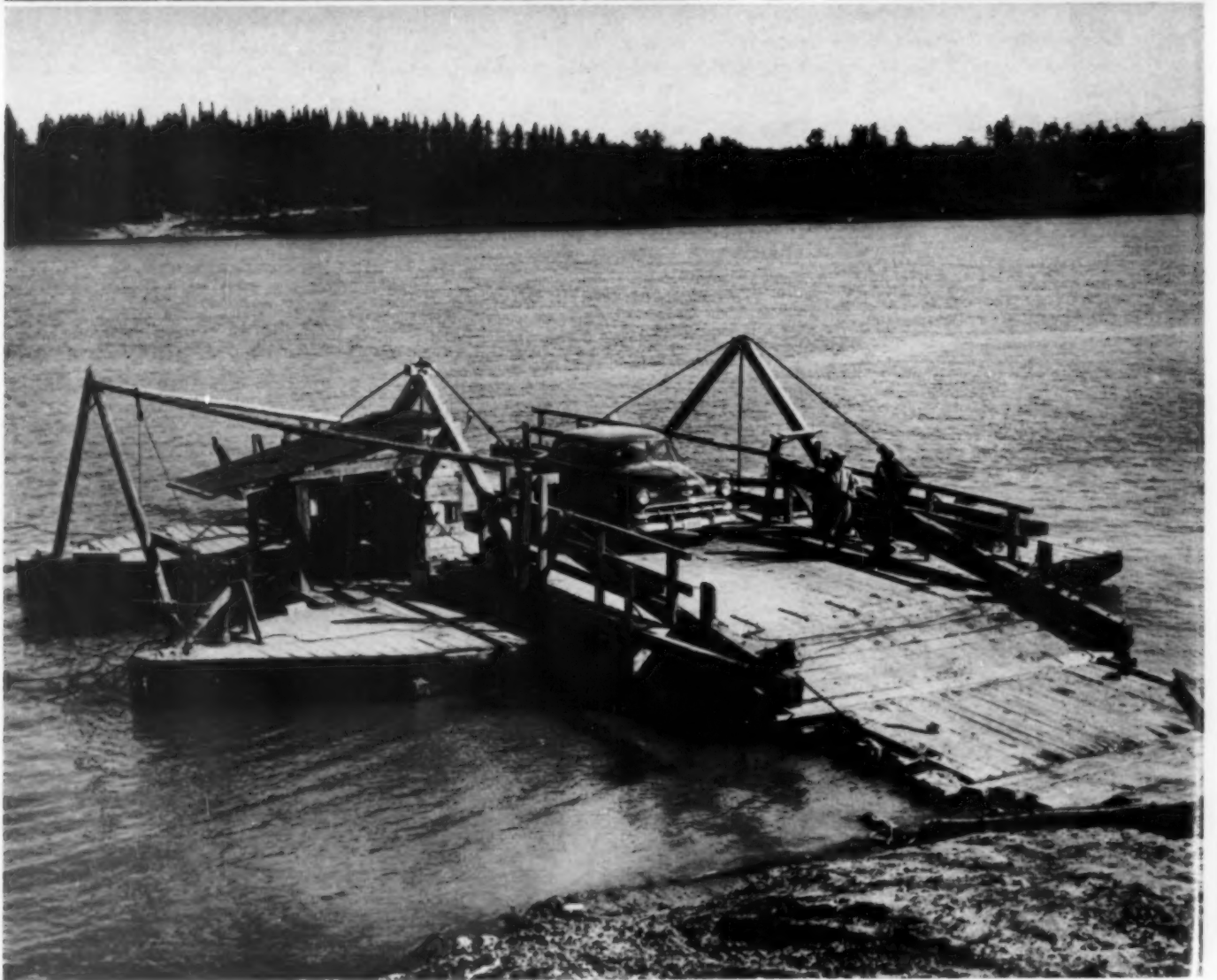
Winter or summer, Hay River carries on serenely, although the tempo of its life has been quickened by the construction of the highway that links the Northwest Territories with the rest of Canada.



Johnny Rimer, a Dogrib Indian from Fort Resolute, works as a carpenter in the community of Hay River.

A Beaver Indian girl at Upper Hay River post working on a beaded belt. Beaver Indians have lived in the area for centuries.



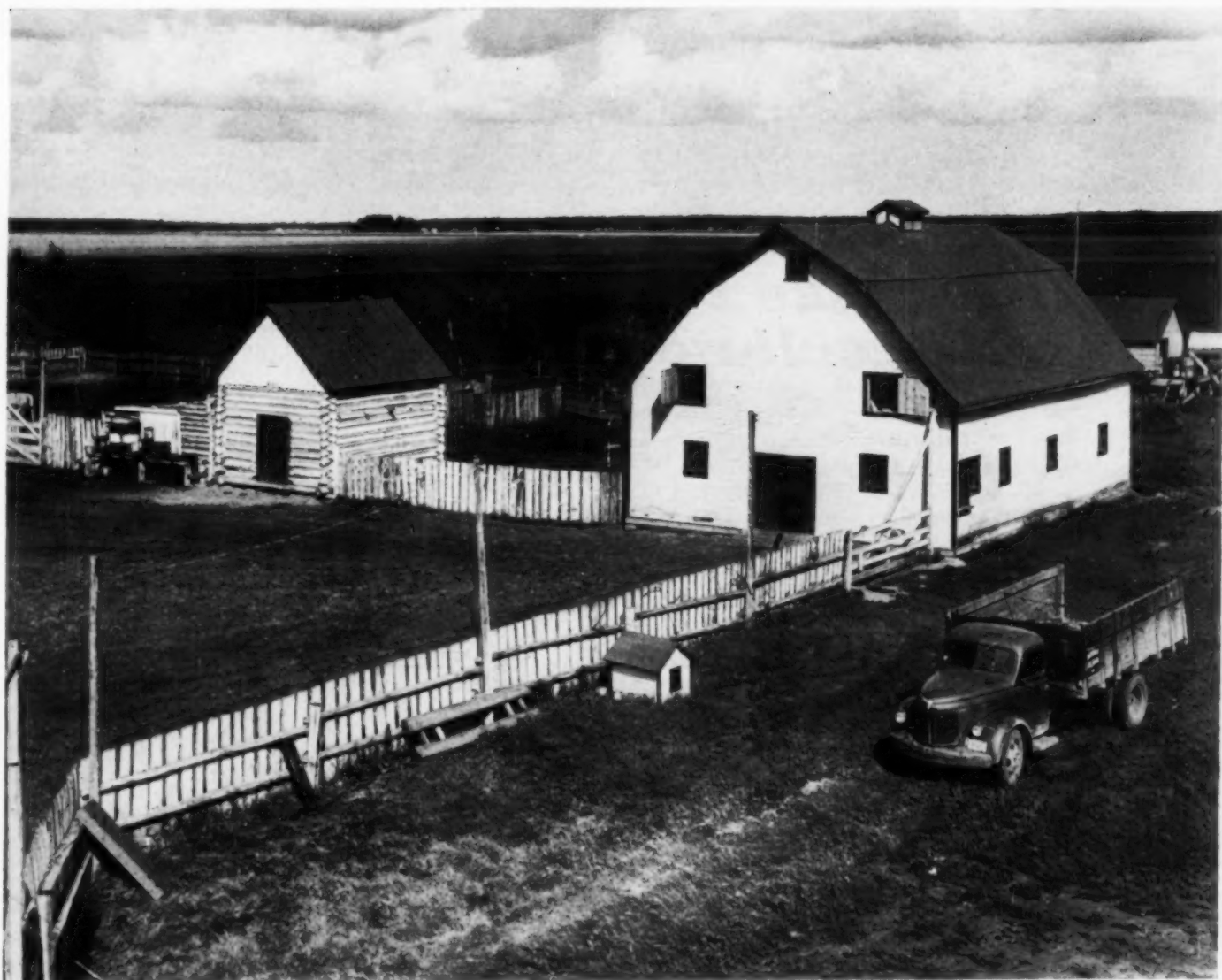


Left:—The original settlement of Upper Hay River post, built on a river bend, is now located one-quarter mile off the Mackenzie Highway.

Bottom left:—Forty-eight miles east of High Level on the Mackenzie Highway, a ferry service provides transport across the Peace River to historic Fort Vermilion.

Right:—Section of the Experimental Farm at Fort Vermilion where turkeys are raised successfully.

Bottom:—Short roads lead off the Mackenzie Highway into the farming blocks. The attractive farmstead of Fred Jackson at Keg River, west of the highway.





Grass—the Foundation of Agriculture

by T. M. STEVENSON

Photographs by Canada Department of Agriculture

IT HAS BEEN SAID that grass is so important in the life of man that if it were to disappear from the face of the earth, man could not long survive. While this statement is based largely upon conjecture, it is nevertheless a well established fact that no other group of plants has made so great a contribution to the needs and well-being of the human race. Our supply of meat, milk, wool and leather is provided almost wholly by animals that feed chiefly on grass in the forms of pasture, hay

and silage. Likewise the great cereal crops, all of which are botanically true grasses, provide the basic foods for nearly all of the earth's people. Viewed in the light of these facts, it is little wonder that grass is regarded as the indispensable form of plant life.

Grass has attained this leading position among the food-producing plants of the earth largely because of certain inherent characteristics. We recognize that it can establish itself, grow, reproduce and successfully dominate the

At top:—Natural grass ranges of the type seen here are typical of much of the land in the foot-hills of the Rocky Mountains in western Canada.



Natural grass rangelands of the southern Alberta prairies. Strip-farming is practised on farms shown in background to prevent wind erosion.

vegetation, in competition with most other species, under a wide range of soil and climatic conditions; that grass herbage is high in nutritive value and is readily consumed by livestock in either the fresh green, ensiled or dried condition; that because large amounts of carbohydrates are stored in the seeds they are widely used as a source of food for human consumption; and that grass crops are relatively high yielding, easily harvested and stored, and when necessary can be readily eradicated by simple cultural operations. However, it is not generally recognized that basically grass is important as a source of food because of its green colour.

The green colouring of most of our plant species, including grass, is due to the presence

of a remarkable substance known as chlorophyll. This substance is not, as may be supposed from casual observation, dispersed in the form of a dye uniformly throughout the plant tissue. Close examination under the microscope shows it to be contained in definite lens or disc-shaped grains within the cells of the plant tissue. It is usually found in greatest concentration in the cells of the leaves.

Plants containing chlorophyll, when in the presence of light, are capable of manufacturing or synthesizing sugar which is commonly transformed into starch. The raw materials used in forming these carbohydrates are derived from the carbon dioxide of the air and the water obtained from the soil. This process which is

carried on by green plants in the presence of light is known as photosynthesis.

The photosynthetic carbohydrates which are formed in the green leaves of grass plants provide the basic food of both plants and animals. The green plant, when supplied with other necessary nutrient materials from the soil, is able to transform these carbohydrates into fats, proteins and other substances. Thus, all of the organic foods of plants and animals are directly or indirectly products of the photosynthetic process, and all are basically dependent on chlorophyll for their formation.

For many years scientists have sought to learn the secrets of photosynthesis, the process by which the green chlorophyll converts light into chemical energy which it uses to power its miniature factory. Only recently it has been announced that artificial photosynthesis has been accomplished in the laboratory. However, the extent to which it may be possible to use this process on a commercial basis in the synthesis of basic food materials has yet to be determined.

The term "grass" in common usage refers primarily to those plants which are grown for hay or for pasture to provide feed for grazing animals. It is composed chiefly of two botanical groups or families of plants, the true grasses and the legumes. The general characteristics of the grass family are so well known that little need be said here, except that members of this family dominate the vegetation in almost all of the non-forested areas of the earth. The legumes include the commonly grown clovers, alfalfa, and vetches, in addition to many food plants. This group of plants ranks second only to the true grasses in its importance to agriculture.

Legumes differ from all other commonly grown food plants in that they can, through the action of symbiotic root-nodule bacteria, obtain combined nitrogen as a nutrient from the almost inexhaustible supplies of inert nitrogen in the atmosphere. Consequently, unlike the true grasses, these plants are not entirely dependent upon the soil or nitrogenous manures to provide that very necessary element of nutrition which is frequently in short supply. Moreover, non-legumes growing in association with them benefit from the nitrogen which they release in

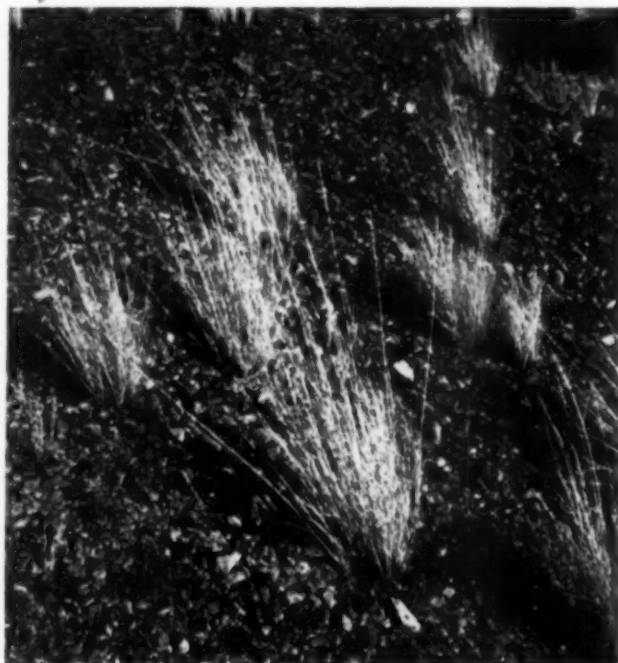
the soil. This is one of the chief reasons for the widespread use of this group of plants as an important constituent of our cultivated grass-land vegetation.

Importance of Grass in Canadian Agriculture

Canada's agriculture is dependent upon grass to a very great extent. In addition to approximately 54,000,000 acres of rangeland and unimproved farm pastures, which are covered largely with native grasses, we have about 11,000,000 acres of hay grown on cultivated land and over 10,000,000 acres of sown or improved pastures. Thus, approximately 75,000,000 acres, or over 43 per cent of the total acreage of occupied land in Canada, produces grass that is used primarily for livestock feed.

The area of improved or cultivated farmland occupied by grass varies greatly from one province to another and under different systems of farming. More than 50 per cent of the cultivated land in the eastern provinces of Canada and in British Columbia is occupied by grass crops, grown for hay, silage or pasture, in addition to considerable areas of natural grass-land. In the Prairie Provinces sown or improved grass-lands occupy less than 10 per cent of the total area of cultivated land. However, more than 81 per cent of Canada's unimproved, occupied, natural grass-lands or rangelands are located in that area.

Stands of native bunch grass are common on stony slopes in the interior of British Columbia. Its carrying capacity is low, but if the range is carefully managed, grazing animals can make rapid gains.



Much of the native grass range in British Columbia's interior is sparsely forested. These so-called savannahs provide good grazing.

Native Grasses of the Rangelands of Western Canada

These grazing lands provide more than 90 per cent of the pasture herbage in Canada's four western provinces. Some 45,000,000 acres are natural grass-lands. According to the nature of the grass cover, these lands have been divided into five major types known as the short-grass, mixed-grass, submontane, palouse, and tall-grass prairies. The first three occur in the southern areas of the three Prairie Provinces and represent a gradation from a semi-arid climate in the south to a semi-humid climate in the more northern sections.

In the short-grass area Blue Grama grass, *Bouteloua gracilis*, is the dominant species. The mixed-grass prairie vegetation is dominated by slender wheat-grass, *Agropyron pauciflorum*; bluejoint, *Agropyron smithii*; and spear-grass, *Stipa comata*; while rough fescue, *Festuca scabrella*, is the most common species in the submontane areas. The palouse prairie occurs only in the interior of the Province of British Columbia. In those areas Bluebunch wheat-grass, *Agropyron spicatum*, provides the dominant vegetative cover. The tall-growing Big Blue-stem, *Andropogon furcatus*, and Prairie Cord-grass, *Spartina pectinata*, are dominant in the tall-grass prairie of the Red River Valley and throughout the Portage plains in the Province of Manitoba.

These indigenous species vary greatly in growing habits in different areas, but certain similarities may also be noted. For most of the species, growth begins in April or early May and is relatively slow for three or four weeks. A more rapid rate of growth follows and continues until early July. During the hot, dry midsummer period, there is little or no growth and the grass remains in a semi-dormant condition until fall moisture and cooler weather encourage autumn growth. It is estimated that from 80 to 90 per cent of the total yield of herbage from these grasses will be produced by early summer, that is, within a period of two to four months.

Notwithstanding these similarities, many of the species which constitute the grass cover in the various areas differ in some important respects. For example, spear-grass makes a relatively early start in the spring of the year



and produces the bulk of its herbage during early June. Blue Grama grass, on the other hand, does not begin growth until mid-May and produces the bulk of its herbage in late June and early July. Both these species occur as dominants or sub-dominants in the short-grass and mixed prairies and complement one another in the pasture mixture. Different species on other types of prairies perform in a similar way to provide green nutritious herbage throughout the grazing season.

Although the cover on some of the prairie types is made up of 200 or more species, usually the few dominant ones provide the bulk of the herbage.

Many of the native species cure naturally *in situ*, or on the stem. This dry, naturally cured herbage is palatable and, although it is somewhat lower in protein than the green herbage, it is usually as nutritious as well cured hay.



A fine natural stand of reed canary grass in Eastern Canada. It will thrive in poorly drained or flooded areas where the cultivated grass will not survive.

Because many of the native species possess this characteristic, the rangelands of Western Canada supply palatable and nutritious feed after growth ceases. Although the period of active growth is short for many of the species, they provide excellent grazing from early spring until the ground is blanketed in snow. In the "chinooked-off" areas these species, if properly managed, will provide year-round grazing.

Yields of herbage obtained from these natural grass-lands are not high, and their "carrying capacity" is relatively low. Nevertheless, as they provide grazing for more than 4,000,000 animals, they constitute an important natural resource.

Origin and Distribution of our Cultivated Grasses

While there are known to be more than 600 botanically distinct kinds of grasses and legumes native to Canada, as yet only two of these have found places as cultivated grass crops. Slender wheat-grass, *Agropyron pauciflorum*, and reed canary-grass, *Phalaris arundinacea*, are indigenous and widely distributed in Canada. They

are grown only to a limited extent under cultivation as special purpose crops, and have not yet come into general use.

The most useful species commonly grown for hay and pasture in Canada came from Europe and Asia. These include the following:

Timothy, *Phleum pratense*
 Awnless brome-grass, *Bromus inermis*
 Crested wheat-grass, *Agropyron cristatum*
 Orchard grass, *Dactylis glomerata*
 Kentucky blue-grass, *Poa pratensis*
 The fescues, *Festuca* species
 The bent grasses, *Agrostis* species
 Red clover, *Trifolium pratense*
 Variegated alfalfa, *Medicago media*
 Sickie alfalfa, *Medicago falcata*
 Bird's-foot trefoil, *Lotus corniculatus*
 White clover, *Trifolium repens*
 Alsike clover, *Trifolium hybridum*

Throughout history man has taken the food grasses or cereal crops with him wherever he has gone. Today these are grown all over the world, wherever soil and climatic conditions will permit. However, the species used for hay and for grazing, until relatively recent times, were moved about largely by accident. The most important single factor in the geographical distribution of these crop plants in early days was the accidental transportation of their seeds by pioneers, traders and explorers. During more recent years scientists throughout the world have co-operated in an organized program for the exchange of plant material. Agricultural research institutions and botanic gardens in various parts of the world have been the chief contributors to this program.

The extent to which the exchange of local species, strains, and varieties of grass plants has operated, and some indication of its value in contributing to the improvement of Canadian grass-lands is indicated by the fact that during the past twenty years the Forage Crops Division of the Experimental Farms Service has received more than 16,000 lots of forage seed, chiefly grasses and legumes, and has grown and tested them under a wide range of soil and climatic conditions and for different uses. Additional large numbers of plant intro-



The fence divides two ranges. On the right the grass cover has been destroyed by overgrazing; on the left careful management has maintained it and developed a productive range.

ductions have similarly been secured and tested by other Canadian agricultural institutions. Some of these plants have proved of value and have been quickly accepted for production as cultivated crops. Many others, although unsuitable for commercial production, possess certain characteristics which have made them useful in the plant-breeding program.

Some of the relatively recent introductions from abroad which have proved of great value in Canadian agriculture are awnless brome-grass, crested wheat-grass, Ladino white clover and bird's-foot trefoil.

The records indicate that the first lot of seed of awnless brome-grass to arrive in Canada was obtained by the Experimental Farms Service from Riga, Russia in 1889. A second shipment of the seed was obtained from Germany in 1895. Most of the brome-grass grown in Canada today can be traced back to these importations. This species is now grown widely as a constituent of cultivated hay and pasture and is regarded as one of our best available grasses.

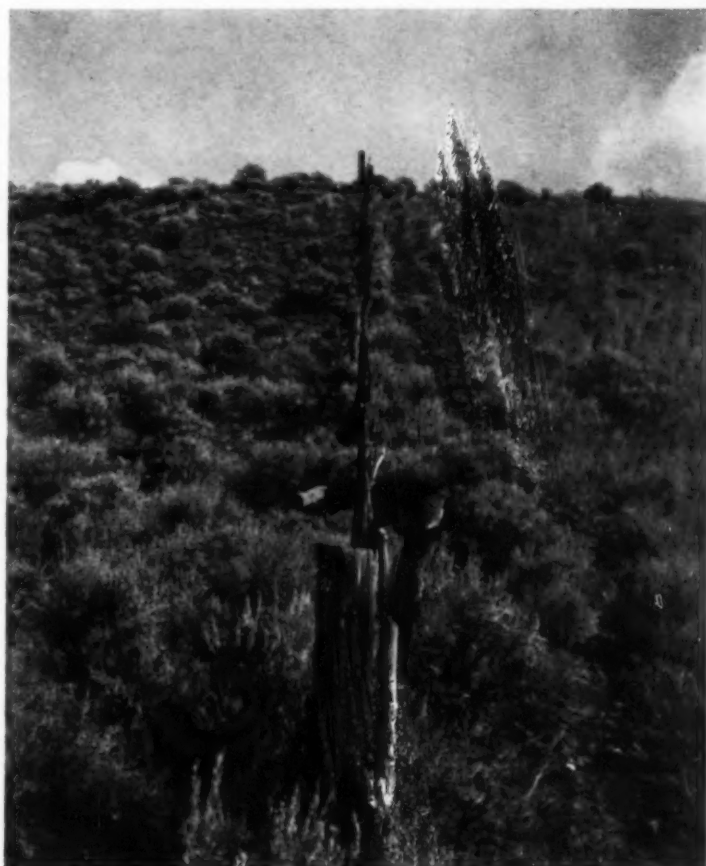
On the left is shown one result of overgrazing—sage brush has replaced the natural grass cover; on the right natural grass cover has been maintained by controlled grazing.

Crested wheat-grass came to Canada from the dry steppe of Western Siberia. Among the first lots of seed to arrive was one secured by the University of Saskatchewan in 1915. This grass has shown itself to be superior to other cultivated grasses in the drier areas of the Canadian Prairies.

Ladino clover, a giant form of white clover, came originally from the province of Lombardy in Northern Italy. Records indicate that it was first grown about thirty years ago from seed obtained from an agricultural institution in Switzerland. It has proved to be a valuable legume for hay and pasture in many parts of Canada.

Bird's-foot trefoil is a crop that has been grown in Europe for many years. Numerous quantities of the seed were brought into this country on different occasions, but all lacked winter hardiness. However, a hardy variety of the species was secured in 1937 from Cornell University at Ithaca, New York, and this is now a common constituent of pasture herbage in many sections of Eastern Canada.

More recent promising plant introductions include: Tall wheat-grass, *Agropyron elongatum*; Intermediate wheat-grass, *Agropyron interme-*



dium; and Russian wild rye, *Elymus junceus*. Seeds of these species were secured from Russia about twenty-five years ago. All three show promise for use in rangeland improvement in the southern prairie areas.

Grass as Feed for Livestock

Good pasture herbage is generally regarded by agriculturists as the cheapest and best feed for grazing animals. It provides all of the minerals, vitamins, proteins and other nutrients required to produce meat and milk, and at a lower cost than from any other known source.

The comparatively low cost of grass in the form of hay and pasture has been verified by carefully conducted experiments. Data secured from many tests conducted over a period of years in Eastern Canada have indicated that, while it costs \$8.81 to produce a total of one ton of digestible nutrients from a good pasture, it costs \$12.21 to produce the same quantity from alfalfa hay under similar conditions. Similarly it costs \$14.71 from timothy hay, \$24.36 from corn and \$56.24 from oat grain. The comparatively low cost of the nutrients obtained from green pasture herbage is due in part to the fact that relatively little labour or machinery cost is involved. The animals harvest the grass and consume it, without curing or processing.



The yield of herbage from hay and pasture, as well as its palatability and quality, depends largely upon the species, the fertility of the soil, and the management practices followed. A good hay and pasture mixture usually consists of a combination of productive species and varieties of grasses and legumes adapted to the particular set of soil and climatic conditions prevalent in the growing area. Such a mixture, when used as a pasture crop, will not only give a maximum total yield of herbage for the grazing season but will also maintain production of high quality herbage at a high level during all periods of that season.

Data secured from carefully conducted experiments show that under most conditions simple grass-legume mixtures, such as timothy and alfalfa, timothy and red clover, or brome-grass and alfalfa, are more productive than those in which a large number of species are involved. However, in many parts of Canada the mixtures containing alfalfa have given higher total yields and a better distribution of herbage throughout all periods of the grazing season than the mixtures containing other legumes.

While the generally accepted practice is to sow hay and pasture mixtures made up of grasses and legumes, there are situations in which the species can be grown separately with better results. Such cases are rare, however. Since legumes usually contain more protein, calcium, phosphorus and sulphur than grasses, a mixed grass-legume herbage is usually richer in these nutrients than that from grass alone. Moreover, the protein content of the grass itself is usually increased when it is grown with the legume. Similarly, legumes, when grown in mixture with grass, are less likely to cause bloating of livestock. Hay made from such mixtures cures more readily than hay made from legumes alone, and it can be handled and stored with much less loss of leaf.

When pastures are sown with a single species rather than a mixture, the relative palatability of the species is of little importance. Grazing livestock soon become accustomed to the least palatable species when there is no choice, and thrive on it. Relative palatability is important, however, when various species are grown in

Many of the improved pastures in Eastern Canada contain a mixture of orchard grass and white clover.



Irrigation often brings rich dividends. This irrigated pasture at Kamloops, British Columbia, produced 827 pounds of beef an acre during the grazing season of 1953.

mixture for pasture. In that case the most palatable species may be overgrazed, while less attractive ones remain untouched. This may make it impossible to maintain a desirable species balance.

High yields of good quality hay and pasture grass can be obtained only from soils that are in a relatively high state of fertility. Data secured from carefully conducted experiments indicate that hay and pasture crops, consisting of species that have high yielding potentials — such as timothy and alfalfa, brome and alfalfa, or orchard grass and alfalfa — can be expected to respond favourably to commercial fertilizer under the same conditions that commonly grown cash crops give increased yields as a result of such applications. As with other crops,

the response of grass to fertilizer varies under different conditions. Experience has shown that soil tests provide a useful guide on which to base fertilizer requirements.

Grass in Soil Conservation

Grass has proved to be one of the most effective crops for use in controlling soil erosion by both water and wind. Tests designed to measure the amount of soil removed by rainfall on a 10 per cent slope at the Central Experimental Farm at Ottawa clearly demonstrated the superiority of grass crops in preventing soil and water loss under such a condition. Measurements taken annually for four years show that during the period from June to October over 31 tons of



Tall wheat-grass sown on the outer face of this dike on the Bay of Fundy coast has helped prevent water erosion above the high-water level. Comparatively new to Canadian agriculture, it will tolerate more salt than most of the grasses commonly grown in Canada.



This was once a productive wheat farm of Canada. During a prolonged period of drifting. The soil has since been lost.

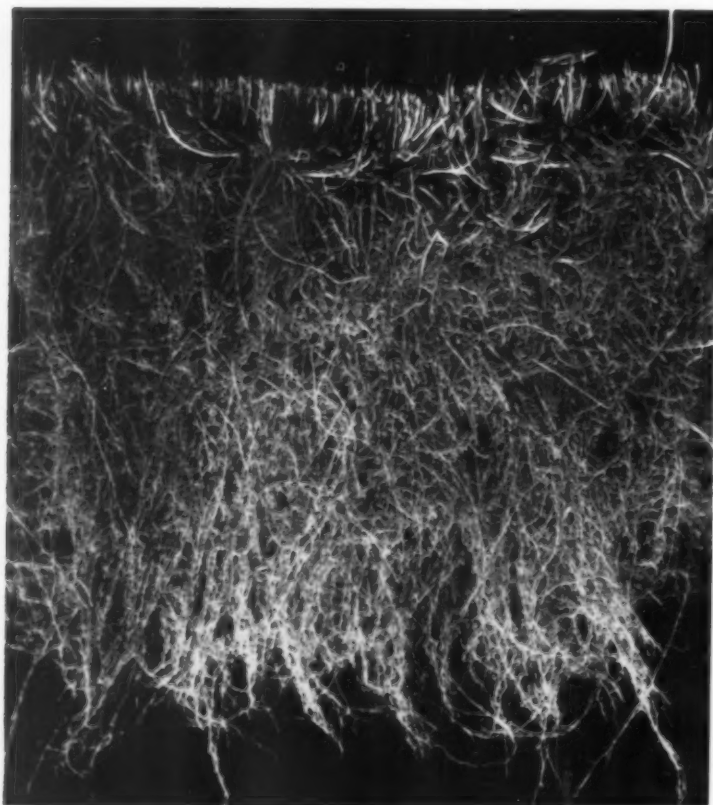
top-soil were removed each year by water erosion from land that was cultivated and uncropped or made into summer fallow. A similar amount of soil was lost through erosion from

land on which a crop of corn was growing in rows which were arranged up and down the slope. The fields producing timothy and alfalfa in the same test lost less than one-tenth of one ton of soil an acre. The amount of rain-water lost through run-off on the same fields was over 17 per cent on the summer fallow and corn fields, and approximately 1.7 per cent or about one-tenth as much on the timothy and alfalfa fields.

When raindrops fall on grass, their force is broken before they reach the soil, for their energy is expended upon the grass leaves. In addition, the grass stems and lower leaves form numerous small dams which trap the water, and hold it in small cells. The rain-water under those conditions, even on sloping ground, cannot gravitate quickly to the lower areas to form rushing torrents. It is slowly taken up by the soil to be used by crop plants; while the surplus, penetrating deeply, is stored in the great reservoir of the soil to maintain water supplies for farm wells and for cities and towns.

Grass-covered soil is also resistant to wind erosion. Cultivated land, when broken from well established stands of grass will usually resist wind erosion for several years, while the root fibres persist and bind the soil particles

This root mass was removed from one square foot of eight-year-old brome-grass sod. The dry weight of its root fibre was more than four tons an acre in the top twelve inches of soil.





Farmland soil section of the southern prairies period it was abandoned because of soil- as stabilized by planting grass.



A vivid illustration of the role played by grass in preventing soil erosion. Only the grassless roadway through the field lost soil as a result of erosion by water. The grass on both sides of the roadway held the soil.

into larger aggregates. On the lighter soil types in the drier areas, a strong grass cover is the only sure means of preventing wind erosion during prolonged periods of drought. During the period 1929-39 large areas of light soil on the Canadian Prairies were devastated by wind erosion. Many of these areas are no longer cultivated and have been left as permanent grass-lands.

Grass also aids in conserving the fertility and productiveness of the soil by increasing the content of organic matter and improving soil structure. Soils developed under a natural grass cover are comparatively high in fertility. The black and brown soils of the Canadian Prairies and the *chernozem* soil of the Ukraine were developed as natural grass-lands and are among the richest soils known in the world. Marked improvement in soil structure of land growing grass for as little as three years, following many years of continuous grain production, has been recorded in Canada.

The amount of organic matter added to the soil by grass roots has been investigated for several species. An examination of crested wheat-grass and brome-grass grown on brown clay-loam in the central prairie area of Western Canada, showed that the amount of root fibre

in the soil increased with the age of the stands. On a dry matter basis, more than two tons of root fibre were contained in the top twelve inches of soil when the stands of grass were



Soil ploughed after wheat was grown (left) and after crested wheat-grass (right). The root fibre of the latter holds the soil particles together. This effect may be observed for several years after the sod is broken.



Timothy-breeding nursery at the Central Experimental Farm, Ottawa. The large cotton cages are used to isolate groups of plants for controlled pollination.

only two years old. When the same stands were left down for eight years, the grasses produced more than double that amount. These facts indicate the greater value of older stands of grass from the standpoint of soil improvement. The same experiments showed also that more than 88 per cent of the total weight of the root fibre produced by these grasses was located in the top twelve inches of the soil. Similarly, less than 6 per cent was found in the 12-24 inch soil layer and only about 1.5 per cent in the 4-5 foot layer.

The Development of Improved Varieties

In the early years of Canadian agriculture, grass and particularly pasture grass was allotted the poorest land on the farm. Grass was looked upon as something that could be grown on land not suitable for other crops. However, that has changed, and today hay and pasture grass is produced with the same care as the best cash crops. This belated recognition has stimulated both farmers and scientists to greater effort in their search for better varieties of grass crops, as well as for better ways of growing them. Consequently, within the last quarter-century plant breeders have set themselves the task of creating varieties of grasses and legumes better suited to the various soil and climatic zones of our country. Their efforts have been attended by a considerable degree of success. Today we have varieties which excel in yield

of both forage and seed, and in quality of forage, drought tolerance, winter hardiness, tolerance of salinity, and disease resistance. Improved varieties recently developed and released for distribution by Canadian plant breeders include Climax timothy, Lasalle red clover, Summit crested wheat-grass, Ensign meadow fescue and Rambler alfalfa.

The potential value of these new varieties to Canadian agriculture can be calculated. For instance, Climax timothy, a new high yielding rust-resistant variety developed by the Forage

Red clover plants are grown in sand in a greenhouse for experimental purposes. Feeding is controlled to determine the response to various elements or combinations of them.





A breeding nursery for orchard grass. Parchment bags are used to isolate the plants and ensure self-pollination.

Crops Division of the Central Experimental Farm at Ottawa, has been widely accepted by farmers throughout the timothy-growing areas of Canada, and its seed is in heavy demand both at home and abroad. The results of carefully conducted tests indicate that this variety may be expected to yield more hay than commercial timothy by an average of about 12 per cent, and more pasture herbage by about 16 per cent. If the Climax variety of timothy replaced commercial timothy on the approximately 7,500,000 acres of land producing timothy hay and on the 6,500,000 acres of pasture in Eastern Canada, the annual farm value of timothy production in that area would be increased by about \$15,000,000.

Another new variety of interest is Rambler alfalfa, which was developed recently by plant breeders at the Experimental Farm at Swift Current, Saskatchewan. It is a legume which will survive and produce when grown in mixture with grass in the drier prairie areas. None of our commonly cultivated hay and pasture legumes can be grown successfully under those conditions. Rambler spreads by creeping roots produced well below the surface of the soil. Preliminary tests indicate that on the drier prairies it is superior to our other legumes.

At present considerable emphasis is being

placed on the development of varieties that are resistant to destructive diseases. As the significance of many common diseases of grass as factors in reducing crop yields has only recently been recognized, breeding for disease-resistance is just beginning to receive the attention that it deserves. While the value of sound cultural practices, rotation of crops, and seed disinfectants in minimizing reduction in yields of grass crops by disease is generally recognized, it is now clear that disease-resistant varieties will afford the greatest measure of control in this field.

Other Uses of Grass

The beneficent effects of grass are not limited to agriculture. This is obvious when we consider the hundreds of thousands of home lawns; the great system of federal, provincial and municipal parks and boulevards; school playgrounds; athletic fields; golf courses; bowling greens; cemeteries; the grass on the shoulders of highways; and the important part grass plays around the runways of airports. Grass has a high value in making the land of Canada of service to its citizens. Our agricultural scientists are now seeking new and better ways of increasing the value of grass both to agriculture and urban and suburban communities.



Much of South-west Arabia is desert. Here camels, traditional "ships of the desert", are frequently used for transportation.

In South-West Arabia

by E. M. D. LESLIE

A PERSIAN POET, many years ago, wrote "Aden gives to the panting sinner a lively anticipation of his future destiny." Since this was written the climate has not changed for the better, and at least one Canadian, in the heat of the January sun, made New Year's resolutions that were unusually restrictive.

The Aden Colony and Protectorates, East and West, excluding Perim and the Kuria Muria Islands, have an area of 112,075 square miles — almost the size of Arizona. Between October and April the temperature is hot, thereafter it is hotter. Rainfall is scanty. At Aden it averages about two inches a year. Geographically the area consists of a narrow maritime plain, which is mostly desert, usually very humid from the moisture-laden sea air and subject to high winds with blowing sand. Behind the plain in the west is a high plateau which rises abruptly and is much broken by mountains, ravines and valleys, some of which are fertile. The greater part of the Eastern Protectorate is desert and barren mountains extending to what the Arabs, with many desolate places to choose from, elect to call the Rub Al Khali¹ — the Abode of Emptiness. A very apt name.

Aden itself is situated about 110 miles east of

the Strait of Bab el Mandeb where the Red Sea meets the Indian Ocean. The Crown Colony of Aden consists of two extinct volcanic craters forming rocky peninsulas, joined by a flat sandy foreshore, enclosing the only good harbour along the Arabian coast. The city of Aden is on the floor of one of these craters where cooling breezes cannot reach it.

It is not easy to say much about the populations of Aden and the Aden Protectorates because, except in the area immediately about the city, no census has ever been attempted. The city has 150,000 people of whom the majority are Arabs, with large minority groups of Indians, Somalis, Pakistanis and Europeans. The total population of the colony and Protectorates is probably about 1,000,000. The literacy rate is very low. In 1954 the figure (colony only) for birthrate was 22.8 (Canada 27.8), death rate 10.8 (Canada 8.7), and infant mortality 130 (Canada 38).

Aden is well administered and law-abiding. Ten miles away, however, affairs are managed rather differently. Fifty miles from Aden many citizens find it necessary to take their rifles with them when they step out of doors. This could be an affectation but there is reason to believe

¹The Rub Al Khali — the great desert over the border in Saudi Arabia.

otherwise. The Aden Protectorates consist of twenty-three states ruled by chiefs or sultans, some selected by the people, others hereditary feudal lords. Each chief or sultan is advised by a British Agent and some have State Councils. There is an assortment of armies and government guards, backed up by the R.A.F. in both ground and air roles. Recently, because certain areas appeared to be getting out of hand, a British infantry battalion was stationed in the colony. However, punitive action against unruly tribesmen is mainly in the form of village-bombing. This is preceded by adequate warning for the inhabitants to vacate the community and take grand-stand seats on the hills.

Aden, with no industrial potential and an export trade virtually limited to salt, is a busy port. The refinery at Little Aden, to which crude oil is brought by tanker, provides bunker fuel. Water, piped from the wells of Sheikh Othman, a town about six miles away, fills tanks depleted in the heat of the Red Sea and

Indian Ocean. There are reputed to be 2,800 miles of tracks in the Protectorate suitable for motor vehicles but anyone who takes a car to Aden for touring purposes will soon find this to be a grossly optimistic estimate.

Aden's neighbours to the north and north-east are not as kindly disposed towards the *status quo* as the Colonial Secretary would desire. Certain Yemenites and Saudi Arabians have been suspected of inciting trouble and providing munitions to law-breakers.

The history of Aden is interesting and there is some reason to believe that it was one of the towns of the Queen of Sheba. It could well have been the Eden mentioned in Ezekiel XXVII 23. I am sure it was the Eudaimon Arabia of the *Periplus of the Erythraean Sea*². In any event, long before its destruction as a pirate nest on orders of Augustus Caesar, Aden was the *entrepôt* of the great trade between India, Persia, Arabia, Africa and the various nations of Egypt, Phoenicia and Europe. Consequent

²*Periplus of the Erythraean Sea* — This was a practical seaman's guide or coastal survey for the use of merchants sailing from the Red Sea to India. It is believed to have been written about A.D. 80 by an Egyptian Greek living at Berenice on the Red Sea. The Erythraean Sea in ancient geography was the part of the Indian Ocean now known as the Arabian Sea and the Persian Gulf.

The almost barren maritime plain of South-west Arabia. The moisture-laden air from the sea makes it humid, and high winds blow the sand across its surface. Rainfall is scanty.

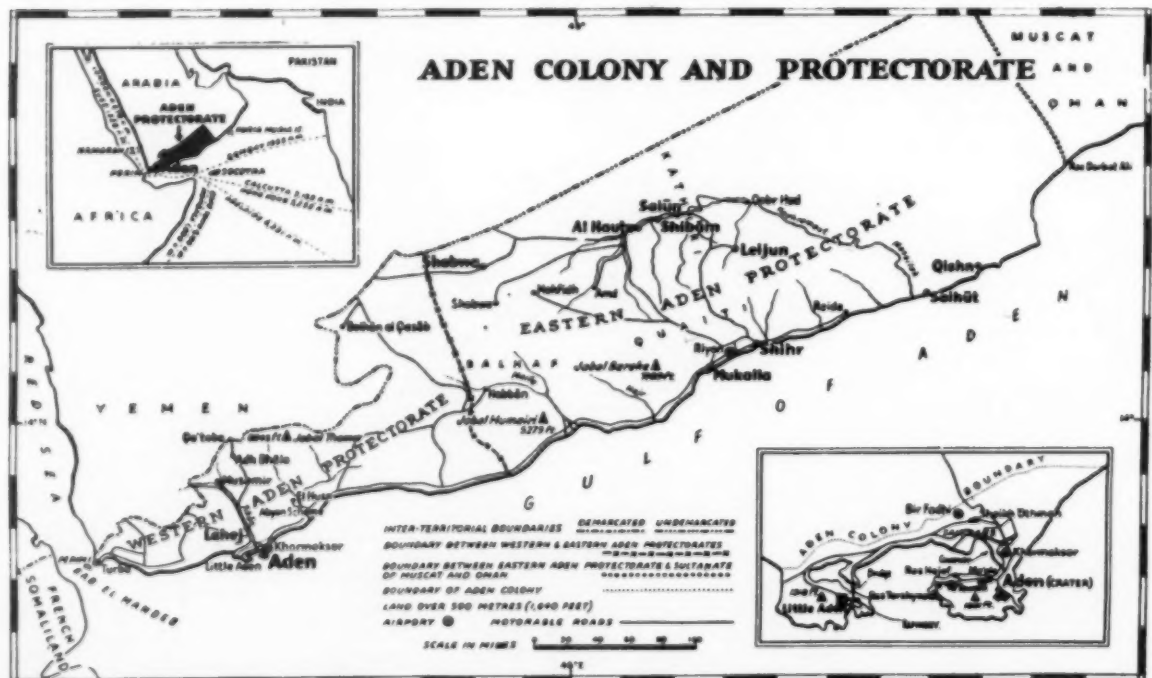


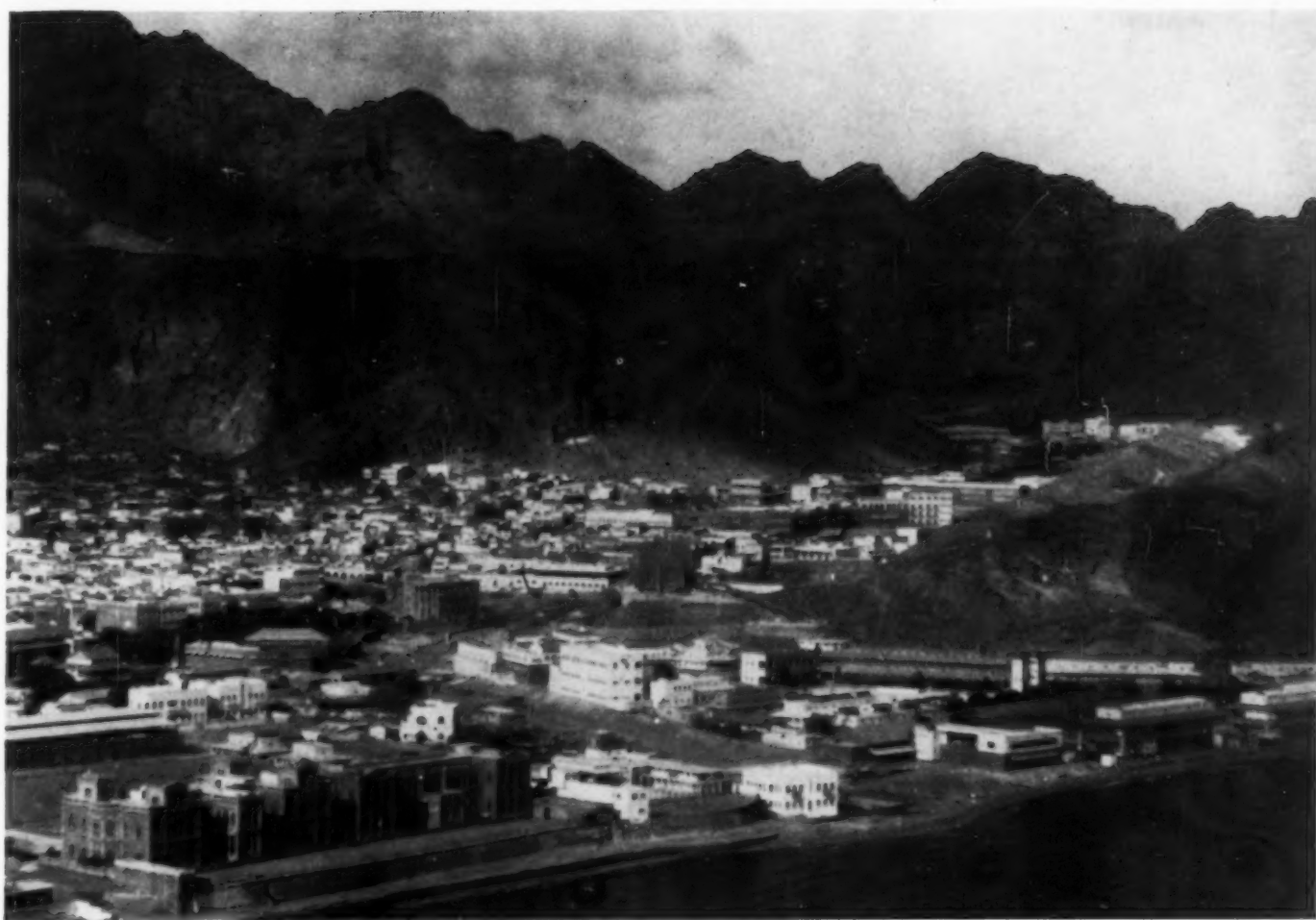


For many long centuries ships and trade have played an important role in the lives of the inhabitants of South-west Arabia. A Red Sea tramp in a crude dry-dock.

upon the re-discovery of the route around the Cape by Portuguese navigators Aden with all of the *Arabia Felix* of Roman days declined.

Duarte Barbosa, who was with the expedition of D'Albuquerque in 1514, has this to say of the Aden he saw: "Passing by these we arrive at the populous and wealthy city of Aden which belongs to the Moors and has its own King. This city has a right good haven and an exceeding great traffic in goods of importance. In this city are great merchants, Moors as well as Jews; they are white men and some of them black. To the harbour of this city come ships from all parts, more especially from the port of Juda, whence they bring copper, quicksilver, vermilion, coral and woollen and silken cloths, and they take thither on their return great stores of spices and drugs, cotton cloths and other wares of the great Kingdom of Cambaya. From Zeila and Barbora too come many ships with foodstuffs in abundance; in return they take back Cambay cloth and beads both large and small and all the goods in which they trade for *Arabia Felixia* and Preste Joam's country also come here, as do the ships of Ormuz and Cambaya; so great is the number of them that it seems an astonishing thing. So much so that this place has a greater and richer trade than





Aden, lying on the floor of a volcanic crater, is a well-administered, law-abiding British crown colony and a busy port. In ancient times it was an important entrepôt of trade.

any other in the world, and also this trade is in the most valuable commodities."

He goes on to describe the direct method by which merchant adventurers of the age dealt with competitors. "At this City arrived a fleet of the King our Lord the Captain General whereof was Afonso D'Albuquerque, at that time Governor of India and in that same port he took and burnt a great number of ships laden with much merchandise and others without cargoes. He then attempted to enter the city, which he did by scaling the walls with many ladders, and when fully forty Portuguese had entered and one bastion had been taken, the ladders all broke from the weight of the multitude of men which was mounting by them, and there remained no means of climbing up. The Portuguese who were inside the bastion

were waiting for help for the space of an hour, when seeing that the Moors were gathering and beginning to force their way in, they let themselves down by ropes from the bastion. In this attack the Moors made a good defence, and



The oil refinery at Little Aden, west of the city of Aden. Crude oil is brought here by tanker. Ships also call at Little Aden for bunker fuel.



Behind the maritime plain in the west rises a high plateau, broken by mountains, ravines and valleys. Some of the latter are fertile. Most of the Eastern Protectorate consists of desert and mountains.



A British fort in South-west Arabia. Note the thick battlement of sand-bags on the roof. A British infantry battalion is now stationed in the colony.

A man carries what he needs — in England, an umbrella; on the borders of Yemen, a gun. A British officer confers with a group of well-armed tribesmen near the border.



Car and camel cart. Aden is the meeting place of old and new. In the background a sign advertises a well-known soft drink.

many were slain, also some Christians, among whom were two captains, one slain in the city and the other in the bastion."

The direct method of subduing Aden failed, but D'Albuquerque's simple expedient of catching and burning the vessels of all local competitors³ led to its fall, and the rapacity of the Turks, who took the city in 1538, reduced it to a place of little importance. Sir Henry Middleton, who spent some time as a captive in the dungeons of Aden about 1609 understandably did not think highly of the place. By 1835 the population was reduced to some 500 Jews, Arabs and Somalis. In 1837 a ship of the East India Company out of Madras went ashore near Aden and the pillage and maltreatment of passengers and crew brought a British expeditionary force from India. This punitive expedition stayed and Aden became a colony which grew in importance with the development of the overland route to India. It subsequently became vital as a coaling station on the completion of the Suez Canal in 1869. Until 1937, when it became a crown colony, Aden was governed as part of India. The history of the colony has been restless, and numerous minor campaigns, the latest in 1955 against the Rabizi tribesmen, have been necessary to maintain security in the hinterland.

³D'Albuquerque knew that he could not capture all the cities between Ceylon and Jedda by force. His strategy was to force local competitors to use ports where he had forts and tax collectors and to burn every ship that did not carry a Portuguese licence. This policy led to the ruin of many cities besides Aden.

The road to Adh Dhala, north of Aden in the Western Protectorate, is rough and poorly defined. A roadside camp along the way.



From Aden I went by sea and spent some days on a dhow, one of the coastal trading vessels of the Middle East. As we drifted by Perim while the sun slid low over Africa, the tiny horizon that was mine was invaded by a great ocean liner hurrying down to Bombay and a fat tanker waddling up to Suez. While we pitched and tossed to their passing I could not but think we were like this whole area — pitching and tossing in the backwash of Europe and America, and I thought that it might not be long before Arabia left a turbulent wake of its own.



A farmer proudly displays his new wooden plough, a primitive implement by modern standards. The tribesmen still follow the ways of their fathers.



A view of Halifax's Citadel Hill. In the centre can be seen the white roof of the Cavalier Block, which houses the Provincial Museum. The old moat, buildings and defences have been restored.

Yesterday Is Up The Hill

by WILL R. BIRD

IN THE LONG AGO it was a higher and steeper hill, densely wooded, with the harbour and its gulls on one side and a pine swamp on the other, and the Indians called the slope the "place of many pines." When Louisbourg had become a famous bastion of French might in North America, an expedition set forth from England to establish a stronghold along the Atlantic that would serve as a counterpoise to the French holding. Its leader gazed at the hill after he had entered Chebucto Bay or Harbour and selected it as a natural defence, and on the slopes below the hill he established the first and

only fiat town on this continent. He named it Halifax.

The leader of the expedition, the Honourable Edward Cornwallis, had the trees cleared from the hill and erected there a rude palisade enclosing log quarters for the garrison. Sentries on duty watched as British warships and countless transports assembled in the harbour for action against Louisbourg in 1758, and the next year they saw General Wolfe sail from Halifax for his great and final adventure on the Plains of Abraham.

The American Revolution created a small

YESTERDAY IS UP THE HILL

panic amongst Halifax officials and there was feverish activity until a hasty system of trenches and battery positions had been constructed on the hill. But when hostilities ceased forgetfulness set in. So the hill was in a sorry condition when Prince Edward, the ambitious six-foot soldier, who was never in favour with his father, King George the Third, came to rule the military with iron hand. He set every man available to work on the defences — sappers, soldiers, militia, and the unruly Maroons who were temporarily in the province. His men cursed and groused as they toiled with spade and mattock under the hot sun, sweating their systems clean of West Indies rum, and lamenting the fate that had brought such a tyrant to command them.

He took fifteen feet from the top of the hill and made a better site for a fort of timber banked with sod. On the seaward slope below he built a fine house with a pillared portico and there established his piquant French mistress — Alphonsine Thérèse Bernadine Julie de Montgenet de Saint Laurent, Baronne de Fortisson, formally called Madame St. Laurent by the socially elect, and Julie by the devoted Prince. There may have been some individuals who frowned on Edward's way of life but the

majority accepted the situation and paid due deference to the couple.

The Prince was an early riser and a stickler for discipline. He had early parades, and woe betide those who tried to evade them. So it was that Julie became aware of whippings carried on at the fort's gate, and came to know of a grim gallows erected for deserters. As she wanted to be away from such scenes, the Prince took her to a place half an hour's ride from the hill, and all was well.

Twenty cannon were placed on the new defences, and two flagstaffs were erected, one of which served in the chain of visual telegraph stations that extended to Annapolis Royal and around the Bay of Fundy to Fredericton. The Prince gave no one rest until he had such communications arranged, for on him depended the defence of the Atlantic provinces. When the work was completed he named the stronghold Fort George in honour of his father, but this seemed to make small impression in London where those in power had viewed with alarm the prodigal expenditures of the Prince. Edward was called home, and his final suggestions were that a town clock be erected, as he stressed punctuality, and that a number of deserters be hanged. The clock was duly

A memorial on Citadel Hill to Canadians who served at sea in the Second World War.



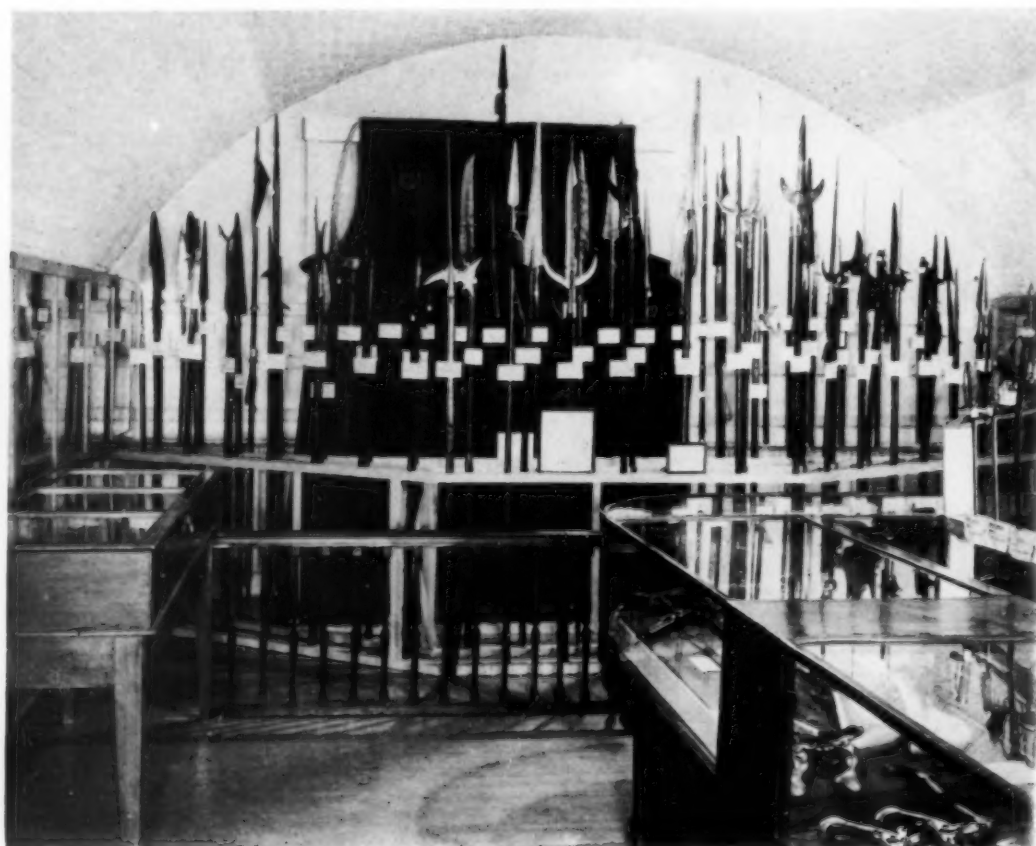


A display of military helmets, hats, caps, and arms in the Military Museum on Citadel Hill.

erected, but most of the deserters were pardoned.

When Edward was gone, affairs drifted as they had done before. When the War of 1812 began, there was another flurry of preparation, the chief project being the construction of a large powder-magazine which held more than 1,300 barrels of gunpowder and was considered by many of the town fathers to be more

dangerous than any probable enemy. They were talked down by those who knew the United States wanted very much to conquer Canada, and that if another war came the port would be the first objective of armed forces across the border. Town officials backed the military in efforts to make London comprehend the situation, and at long last and reluctantly orders were given to construct a new



A bristling array of weapons used in hand-to-hand combat, displayed in the Military Museum.

YESTERDAY IS UP THE HILL

Citadel on the hill that would be strong enough to repel attackers from both seaward and landward positions.

American visitors are often surprised to learn that first designs for the new fortress were submitted by Colonel James Arnold of the Royal Engineers, son of the famous Benedict Arnold. The work was finally begun in 1828 and went on for thirty years, costing twice the amount estimated at the beginning. The engineers took another seventeen feet from the hill and graded the slopes with the earth removed so that the garrison could enfilade every foot of ground with heavy fire. The walls were built with iron-stone and granite quarried at Purcell's Cove and taken by barge to the wharves, then hauled up the hill by main strength and primitive tackle.

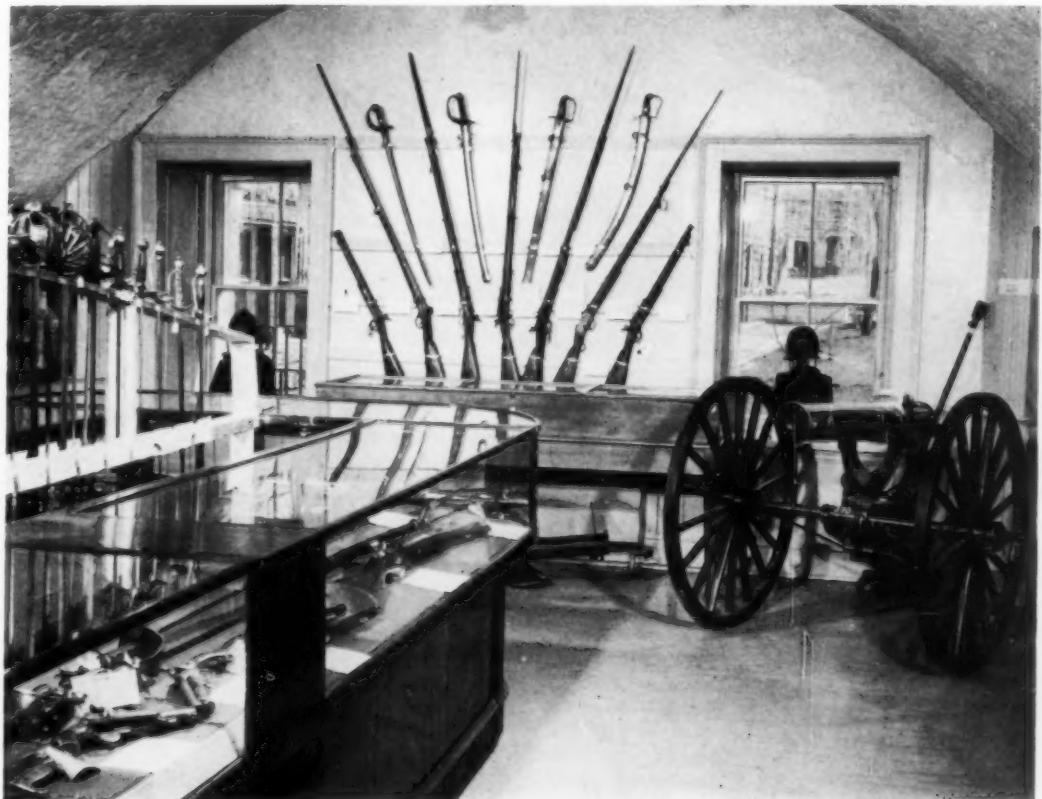
The engineers were from the Old Country and did not allow for the action of frost and thaw during a Nova Scotia winter. Soon much of the moat was in bad repair. It had to be taken down and heavier stone had to be placed in deeper foundations. The moat walls held nothing heavier than harbour fog at certain seasons, for no water was available to pump into the barrier. Three wells and three large tanks to hold rain-water solved the water problem to some extent, then a large brick sewer was laid down the face of the hill to the harbour, causing tales that still persist of a

secret tunnel leading out to George's Island. Seventy-one cannon were placed, and when the project was completed the first soldiers housed in the Citadel were men of the Foreign Legion, recruited in New York by Joseph Howe for service against the Russians. Most of these men were Germans, and fine singers.

At least two generations of Haligonians rejoiced in the completion of the Citadel, for it provided a grand military "show" for visitors. Noon and sunset guns told the hour, and batteries saluted the arrival and departure of warships of all nations. The guard was changed regularly down at Grand Parade below the Citadel, and seventy-five different famous British regiments were in the hill barracks at one time or another. Sham battles were held on the slopes, and glittering parades were staged on holidays. Then the Imperial troops departed and once more the Citadel was forgotten.

Two world wars saw Halifax as the western anchor in the defence of the Atlantic, the famous "east coast port" from which convoys sailed after being made up in Bedford Basin. Air defences were installed at Point Pleasant Park and other sites, but no one considered the Citadel. When peace came visitors again went up the hill to gaze over the harbour, common and dockyard. Then the Historic Sites and Monuments Board of Canada urged that

Swords, muskets, bayonets and other weapons are part of the collection of the Military Museum.





A corner of the Maritime Museum of Canada, which is also on Citadel Hill.

the Citadel be preserved, and work began to restore it and the area to former glory. Now the old moat and other defences and buildings are as they were a century ago. Canada's naval memorial was unveiled on the slopes of Citadel Hill last summer and it is strikingly beautiful.

The Maritime Museum of Canada* began in a small way at the Halifax Dockyard and was housed in a brick building that had to be removed to make way for one of the piers of the Angus L. Macdonald Bridge, so it was transferred to Citadel Hill and housed in the ancient casemates. Many visitors are fascinated by the ship's bell that hangs at the entrance and by the museum's models of German destroyers, Canadian submarines and many other craft from the famous *Bluenose* to well-known liners of various steamship companies.

Later a Military Museum was opened. Today it is a major attraction. The entrance is unique, as the ancient casemate is practically filled by a miniature model of old-time Halifax showing the early blockhouses, Government House, first streets, Grand Parade and Citadel Hill. The first casemate of the Museum proper contains displays of small arms, swords of all sizes and types, pole arm weapons, and gas masks used in the First World War including

the old flannel bags that were suffocating. There are machine-guns of different design, rifle grenades, hand grenades, and a wide array of pistols from ancient cavalry flintlocks to German flare pistols. There is every type of bayonet from the first invented down to the saw-tooth variety issued to German pioneers. The rifles begin as muskets, and there is a huge old blunderbuss that no one man could carry into battle.

In the second casemate are badges of the First World War, nicely mounted in frames and in order representing the various divisions. Then there are medals covering a period of more than a century, and helmets of all kinds from the tall white "sun helmets" of the last century to those of the Second World War. Casemate three has pictures and records of famous Canadian battalions and British regiments which have been stationed at the Citadel. The colours of three Nova Scotia units are there, and a cavalry regiment in miniature is presented under glass. In the fourth casemate are uniforms and headgear, ranging from an old-time field officer's cocked hat to the modest shako of the Nova Scotia militia. The fifth casemate contains life-size uniformed figures in Canadian and British uniforms, including a Canadian Nursing Sister of the First World War.

Four chambers below-stairs are given to a reading room with a reference library, a model room that exhibits old forts in miniature, an artillery display, and a model of old-time barracks, complete with every detail of the soldier's gear of yesterday. The Curator is Captain W. B. Armit, a retired naval officer.

The Cavalier Block was built in 1830, the highest part of the fort commanding all adjacent works, and served as a keep covering the west and north fronts. It was planned to house 322 men in the old days, being 205 feet long and fifty feet wide, with a west wall six feet thick at the base. In later times it housed 143 men. Seven guns were mounted on its flat roof in 1831. During the First World War it was used as an internment camp for German prisoners and the famous Leon Trotsky was there in 1917.

The rooms are larger than the casemates of

*See "The Maritime Museum of Canada" by H. F. Pullen. Volume L, Number 5, May 1955.

YESTERDAY IS UP THE HILL

the naval and military museums and are ideal for displays of the Provincial Museum, which has taken over the entire building. There is a Pioneer Room, with the utensils of yesterday, an Indian Room, with baskets, beadwork and weapons, and a Handcraft Room with beautiful displays. The Curator, George MacLaren, is making full use of the unique space and stone passageways, and has a museum that is a show-piece in itself. The visitor goes from one display to another through arched stone passageways, and the chambers seem to belong to the past as much as the contents.

The building, being of stone, is fireproof. The builders did not bother with stairways, and there are none inside the great stone walls. But a wooden verandah was added and wooden stairs rise from it to the upper floors.

Mr. MacLaren has many ideas for the future and is collecting a wide assortment of old farming implements used in Nova Scotia by the pioneers. These will be displayed on the second floor, and there will be an ancient barn floor with flailing space and a fanning mill, and an old-time stall of solid timbers in which oxen were placed to be shod.

The visitor to Halifax who climbs Citadel Hill will find more than a wonderful view of the city and harbour and Dartmouth over the way, the Angus L. Macdonald Bridge and George's Island. He will walk the high ramparts above the moat and see the old gun emplacements, then descend to enter three museums that are unique in their presentation of all that is interesting in the naval, military and pioneer existence of Halifax two centuries ago.

The rooms in the Cavalier Block are larger than those in the military and naval museums. The Provincial Museum occupies the entire building. Shown here is a section of the Pioneer Room, containing furniture and utensils used by early settlers.





The town of Pollensa, founded by the Romans. Every Good Friday some of its people take part in an enactment of the Crucifixion at the top of the 365 steps flanked by cypress trees in the foreground.

Majorca, Golden Isle of the Mediterranean

by BRAINERD S. BATES

Photographs by the author

EVERY EVENING but Sunday, the noble old *Ciudad de Palma* clears Barcelona harbour, headed south for the largest of the Balearic Islands, one hundred and twenty miles distant out in the black, silent Mediterranean. It takes all night to make the passage and the eastern sky is just turning to light turquoise as the

Ciudad passes abeam of its landfall. As the vessel slips quietly along the brightening coastline the decks begin to crowd with sleepy-eyed passengers eager to see the great Gothic Cathedral of Palma, completely shrouded in mist at that hour, away ahead off the port bow.

The clusters of houses on the shore appear

MAJORCA, GOLDEN ISLE OF THE MEDITERRANEAN

thicker now, and the *Ciudad* passes the break-water jutting out from Porto Pi just as the windows of the big hotels across the harbour are picking up the fiery reflections of a brilliant red sunrise; the day is not yet old enough to dispel the pre-dawn haze which hovers over the city, and the spires and turrets of the Cathedral still look as if they were hanging in mid-air, unconnected with any structure of this world.

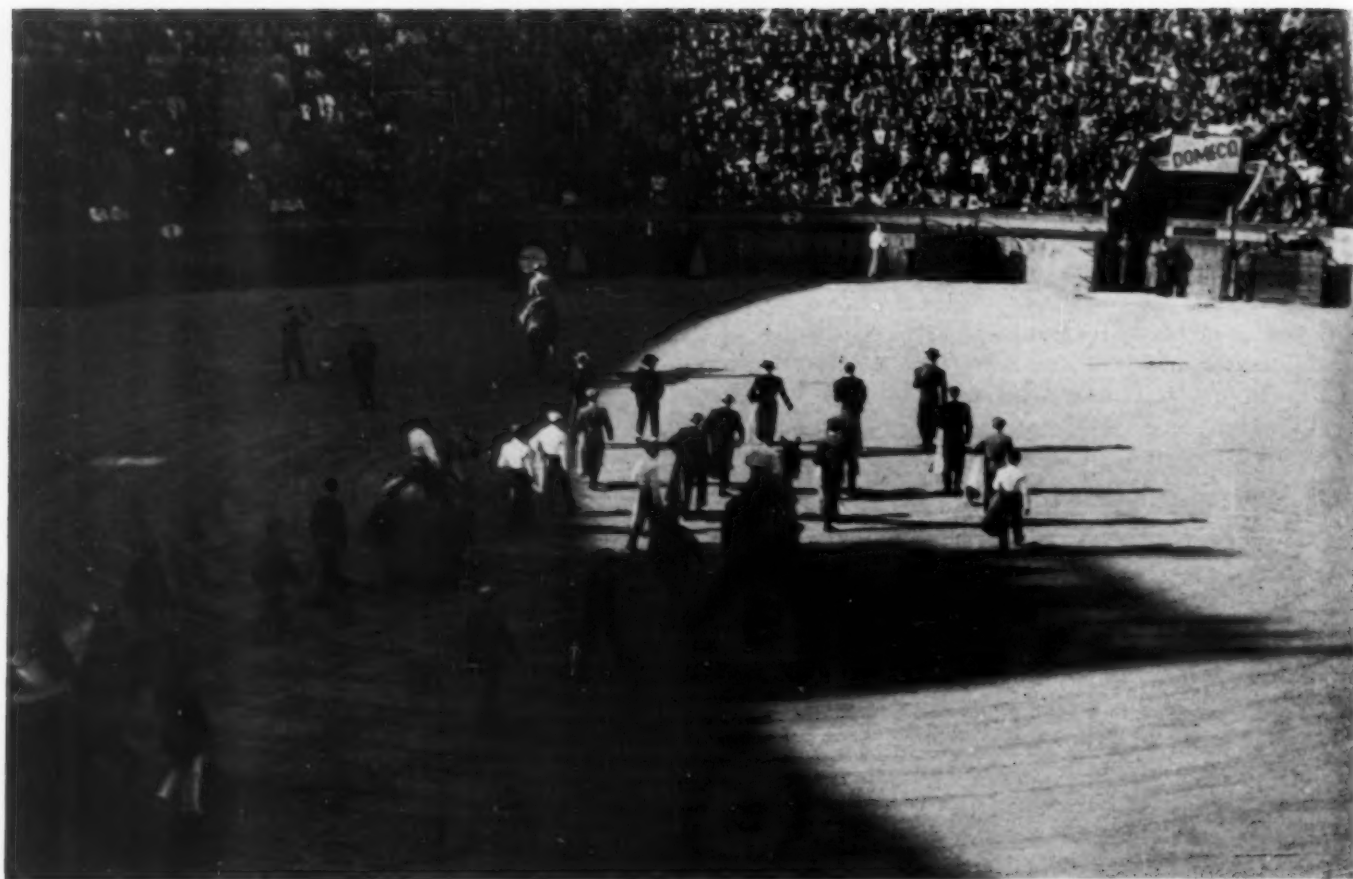
Majorca is used to invasions, but they have not been peaceful ones like these daily shuttlings by boat and plane which bring visitors to the Golden Isle. Formerly the privilege of living in these green valleys, ploughing the flat stony plains, and fishing in the sparkling blue bays had to be earned by right of conquest. It was the Romans who gave the island its name, Majorca, or *Major* to distinguish it from its smaller sister, Minorca, to the north-east. Both Hannibal and Julius Caesar recruited the skilful Balearian stone-slingers to serve in campaigns against their respective enemies abroad. After the Romans came the Vandals, followed by the Byzantines who in turn were overcome by the Arabs in A.D. 798. In 1115 an abortive

crusade to christianize Majorca was led by the Count of Barcelona at the instigation of Pope Paschal III, but the island was back in Arab hands fifty years later. Finally, in 1229, young King James I of Aragon stormed the island with a large army and wrested it permanently from Moorish control. In 1349 it became part of the Principality of Aragon, and was later united to Castile through the marriage of King Ferdinand of Aragon and Queen Isabella of Castile; it remains under the jurisdiction of Spain to this day. All these conquests emphasize the strategic value of Majorca's position; for the island about sixty miles long and forty-five miles wide, is too small to have much territorial importance. But it lies about one hundred and forty miles off the coast of western Spain, and midway between southern France and northern Africa, a position which made it one of the most important shipping centres in the world until the colonization of America gradually shifted the focal point of trade.

History and geography have combined to make the typical Majorcan a well adjusted individual. He lives in a land where there is

*Drinking from the glass wine-jug known as the porron is more difficult than it looks.
A young man from San Sebastian, in Palma for the day, demonstrates his skill.*





The formal desfile opens every bullfight in the Coliseo Balear. Toreros lead the procession, while picadors follow on horseback and assistants on foot.

Palma's waterfront. Every fair afternoon the sail-propelled fishing vessels head out into the Mediterranean. Fishermen work all night under powerful lights, catching mostly squid and cod.



Narrow, winding streets with a medieval atmosphere criss-cross the old section of Palma which must be explored on foot. Flights of cobble-stone steps connect one level of the city with another.



abundant sunshine and the winters are short. Orange trees and almond trees abound and all the staple foods are produced locally—that is to say, bread, olive oil, cabbage, sausages, and an abundance of excellent fish. The cooking is still done over a wood fire and the laundry is done in cold water with a strong bleach. The soil is so rich that with the aid of careful irrigation it often yields three crops a year.

Transportation is provided by two-wheeled donkey carts, and since the government has imposed a tax of over 200 per cent on new cars, Majorca boasts some of the oldest and best cared for cars in existence. There is a very noticeable look of serenity on the face of the average Majorcan due to the almost total lack of concern for the material rewards of life. They are extremely honest folk: there is no worry about entrusting household funds, or granting complete freedom around the house to any Majorcan who may be hired as a servant. Also they are invariably helpful and considerate to foreigners, and this has a very happy effect

on the visitor who comes to live among them.

The population numbers about 350,000 — forty per cent of whom live in Palma de Majorca, the capital city, whose dominating feature is the 600-year-old Cathedral. Religious feasts and processions are of the greatest significance to the people, and afford the occasion for many public holidays. The bull-ring is also an important and popular institution in national life. Signs of Moorish origin are plainly visible in some of the older buildings and there are many underground aqueducts still in use that were originally installed by the Moors.

Local news is well catered to, and in addition the daily *Baleares* prints conscientious summaries of the latest developments in all of the world's trouble spots. The islanders read and mull them over slowly with a sigh. Perhaps they are thinking that if everyone were fortunate enough to live on the *Isla de la Calma* all strife would disappear. The world would profit by a few lessons from the Majorcans on how to enjoy life for just what it is.



Geological Survey of Canada

MOST FARMERS in Western Canada know what it is like to be bothered with rocks in their fields. They spend hours and days picking them off the land. For the past twenty years Mr. W. R. Moore, an Alberta farmer, has been bothered by a rock in his field. What concerns him is not how to get rid of it, but how to keep it there. He has been waging an unceasing war for its preservation, but he feels that it is a worth-while fight, for this rock is one of the most famous in the world.

Is it an outcropping of bed rock? In the area in question there is no other rock in evidence either above or immediately below ground surface, and even if there were, it would not match the composition of this, for it is entirely different. In all the prairies and grain fields for miles around there is no other rock like it. Such a lone specimen is known to geologists as an erratic, and the one in Alberta is considered the largest on earth. Seldom a year goes by when one or more eminent Canadian and

Big Rock

by D. R. KING

Photographs by the author except where credited

American scientists do not make the pilgrimage to view and examine it.

Known locally as Big Rock, it has been for years a mystery as well as a landmark, but only lately has its bearing on the history of the country been recognized. Big Rock is set in a wheat field some five miles west of the Alberta town of Okotoks, where for many years past residents have argued about the origin of the name of the town. It was, like many small prairie towns, named for the river-crossing used by the Indians. But what exactly did the word *okotoks* mean? It was known to be an Indian word. Some thought it stood for "tall trees", but this theory was dropped owing to proof that the word was somehow related to stones. Thoughts turned to "stony crossing", pertaining to the gravelly river bottom at that point. Then old-timers of the district began to remember hearing the ford referred to as "Stone Crossing". This seemed to substantiate the latter idea, and the people of the town were satisfied. Theirs was the town at "Stony Crossing". Meanwhile, Big Rock stood in its field alone, almost ignored. Little more thought was given to the subject until a few months ago when a certain book came into the district.

It was an old book, *Long Lance*, written by Chief Buffalo Child Long Lance, telling of many forgotten Indian rituals and practices. One chapter mentioned a game played by



Big Rock, the largest erratic on earth, lies about five miles west of Okotoks, Alberta.

Geological Survey of Canada

A view of Big Rock's main east-west cleft.

young Blackfeet boys, called "throwing the *okotoks*". There was that word again. But this time it was definitely associated with a tribe, the Blackfeet. The game itself was very simple. It consisted of a group of youths taking turns trying to throw a large stone as far as they could between their legs. *Okotoks* apparently was a stone, one large enough to heave, and not a number but one only. It meant large rock.

The story fell upon the ears of several interested parties, local historians eager to seize this new weapon for their battle. Among them was Dr. John Newton of Okotoks, who spared no effort to ferret out the truth about the new discovery. Since the word was associated with the Blackfeet nation, he took the first opportunity to visit the nearest Blackfeet reservation, at Gleichen, Alberta, a few miles to the north-east, where he had the good fortune to meet an elderly Indian, named A Young Man. In June of 1954 Dr. Newton interviewed A Young Man, then seventy-two years of age. The latter spoke no English, so all conversation had to be translated by his wife. Dr. Newton recorded in writing this interview which concerned mainly the meaning of the word *okotoks*. It went as follows:

"What does *okotoks* mean?"

"*Okotoks* means stone."

"What stone?"

"A high stone west of the town of Okotoks."

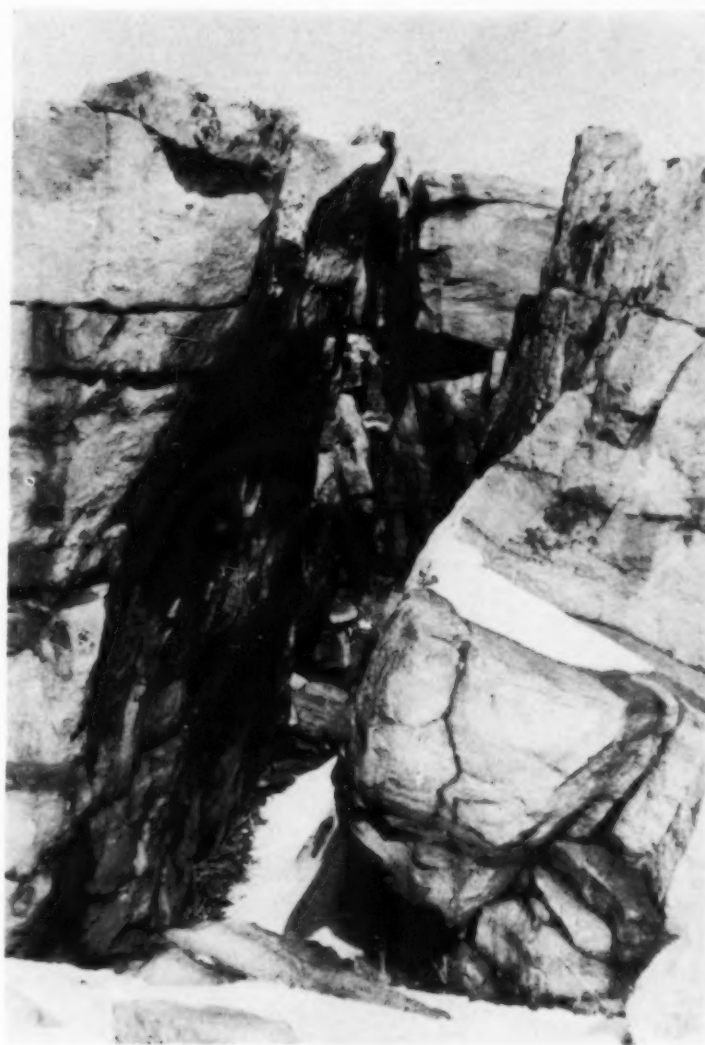
"What is it like?"

"The big rock is split in two and there are smaller rocks around."

"Have you heard of any reference to the stones of the bottom of the river?"

(Puzzled) "*Okotoks* means the High Rock. The river was consequently called *Okotokseeka* or stone river. (River is *nee-ekkta*.) And the crossing was called stony crossing."

A Young Man's story brought out several points which proved beyond a doubt that the town was named for the river crossing which was marked by the big rock. In the days before the white man came to the west each tribe of Indians had its own territory and named all the important points for reference when traveling or speaking of the country. For instance, as most foot-hill rivers have steep banks and can only be crossed in all seasons at certain



points, each crossing was given a distinctive name derived from the most prominent landmark in the vicinity. The name *Spitzee* was given to the crossing of the Highwood River. *Spitzee* means "tall trees beside the water", or more simply, "high wooded banks"; hence Highwood, and High River, the present town.

Okotoks, in the same manner, drew its name from the Indian reference to the "crossing of the river of the big rock". Another theory which received some support was that "stony crossing" referred to the crossing being used by Stoney Indians, a small band having settled close by. However, as *okotoks* was a Blackfeet word and the whole area was Blackfeet territory long before the Stoney Indians arrived, this theory was disproved.

Dr. Newton asked A Young Man about the history of the rock, and the old man told him this legend:

"The story is that a man put a blanket on



A photograph of Big Rock taken in 1910, with a horse-drawn buggy in the foreground. Modifications of its profile may be detected by comparing this photograph with the recent one on the opposite page.

the stone. When it rained he took it back, but the rock said, 'No one gives anything to a rock and takes it back', and gave chase. The man saw a deer and asked him 'Help, help!' But the stoned rolled over and killed the deer. And the man saw a bear and said, 'Help, help! Save me!' But the stone rolled on top of the bear and killed him. And the man met some birds and said, 'Help, help, save me!' And the birds swooped down upon the stone, and they swooped down again and yet again. The fourth time the stone cracked in two as it is today and because of its rolling there are smaller rocks around. Sometimes the Indians would camp by the rock. There are pictures on the rock."

There are many pictures on Big Rock. In several places about the towering sides there are flat surfaces and overhangs which bear the fading red ochre drawings of Alberta's first artists — pictures of men and animals, tents and camps, and many other mysterious figures in the shadowed clefts. Unfortunately, much of the writing has been weathered away.

The story of the rock is old and dates many centuries back into time. The actual geologic history is still not entirely known. The entire

foot-hills at one time, however, were covered with glacial ice. Aerial photographs show clearly that smaller erratics extend in a ragged line from Okotoks south towards Waterton near the United States border and number over 2,000, all of the same composition, many bearing Indian markings. All are entirely foreign to the surrounding earth structure.

The composition of Big Rock itself seems to be a touchy question with most authorities. Few will commit themselves by making definite statements, but it is now classified as consisting of fine-grained quartzite, quartzitic conglomerate and hard sandstone. Buffaloes, rubbing against the lower parts of it in bygone days, have polished some of its surfaces, so that the pink, blue, yellow and green of the stone appears to have a glaze.

Whatever the make-up of the rock, it is cracking and breaking into blocks. This condition is brought on mainly by natural causes, the forces of erosion; however, man has certainly done his utmost to help. Mr. Moore has had difficulty in preventing the complete destruction of his rock. Even before he acquired the farm, Big Rock had been under siege.

BIG ROCK

When the land was first settled, Big Rock stood as a landmark in the centre of the original Quorn Ranch. This was a fairly large holding, extending from Cameron Coulee, some distance to the east, westward to the mountains, fifty miles away. (At that time, in 1886, land was leased from the government for one cent an acre.) Nearby places, named after the landmark, are still known as Big Rock School, Big Rock Bus Stop, and so on. When cattle roamed the range, the rock did not disturb operations; but when the railroads brought a flood of homesteaders and the land was broken for cultivation, stones or rocks were simply not tolerated. Big Rock then was in two sections, criss-crossed by deep clefts, and the larger section had split into smaller blocks, each as large as a small house. (Even today it is 150 feet long, sixty feet wide, rises about thirty feet above ground at its highest point and goes down many feet beneath the surface. It covers more than one-quarter of an acre and obstructs the use of at least one-half of an acre.)

For years the farmers pondered the removal of Big Rock, then western ingenuity showed itself. They hauled tons of straw to the site, completely covering the rock, and set it afire in the hope that the heat would crack it into small pieces. The burning did not do much toward breaking up the rock, but it did deposit a heavy film of soot over the whole mass. The deeper recesses have remained black from the attempt, although the outside has been scoured clean again by wind and rain. A certain amount of rock did break off, to be carted away through the years. Pieces still fall occasionally, for the structure is slowly breaking up from the top. Despite the weather's continuous attack, in recent years the most serious threat to the rock

came once more from man. It was barely saved from total destruction not long ago.

The present owner, Mr. Moore, was surprised one morning to see a crew of men swarming over the rock. When he reached the scene they were already drilling holes into it, preparatory to tamping in dynamite, and they had enough explosive to blow the entire stone into bits. A pipeline company had viewed it as a handy source of cheap ballast for their construction jobs and, without a word to the owner, had brought in a fleet of trucks and heavy machinery to demolish it. Mr. Moore escorted the men from his land.

Though several generations of Albertans have grown up around it, the people of the district have lost none of their respect and fondness for Big Rock. It is still the scene of Sunday picnics. Children scramble over its jagged edges, explore its crevices and leap from crag to crag. Its age-old walls, which gleamed red in the light of Indian fires, now often reflect the flickering fires of wiener roasts. Its crevices have hidden numberless modern children, Indian scouts and even a hunted horse-thief who many years ago hid there for several weeks, until he was able to quit the country in safety.

What makes Big Rock so attractive? It may be its location and immensity, for certainly it is an oddity in such country. It also has historical interest. Is not history written on its walls? It may be its mystery that draws scientists from all over the continent: one party became so interested that they sank a shaft on the north side to a depth of at least twenty feet. With Mr. Moore on guard, Big Rock will probably stand for many a long day, visited by laymen and scientists eager to see for themselves the largest erratic on earth.

The south face of Big Rock as it is now, almost fifty years after the photograph opposite was taken.





THE TRAVEL CORNER



The Royal Palace in Brussels.

Belgian Embassy, Ottawa

Brussels Universal and International Exhibition, 1958

The idealistic basis of the Universal and International Exhibition to be held at Brussels, Belgium in the spring and summer of 1958 has been summarized by a man in the Belgian Congo who has written that it is to be "the meeting place of ideologies which differ but all of which are aimed at better mutual understanding between men."

The practical objective of the exhibition is to present a complete inventory of the achievements of our time in every sphere of activity. Displays are to be arranged so that they may be examined easily and comprehended readily by the layman. But there is an underlying intention of a more ambitious nature — the intention of demonstrating that there no longer need be antagonism between the useful and beautiful.

The various countries participating in the exhibition will have special areas or entire buildings for their

displays. (Canada will have a building of its own.) The Great Central Hall of the exhibition is to contain a large reception centre with an information service, facilities to deal with inquiries for accommodation, a post office, telegraph and telephone services, banking offices, travel agency booths, a hairdressing salon, baths and showers, a restaurant, cafeteria, drugstore, confectioner's shop, book shops, and so on. Elsewhere in the exhibition area there will be commercial concessions for restaurants, brasseries and shops.

Elaborate plans are being made to welcome, accommodate and entertain the 30,000,000 visitors who are expected. Already the reception centre in the centre of Brussels is open. But the enormous task of preparation will continue throughout the remainder of this year and all of 1957 and until the official opening of the exhibition in April 1958.

Baron François Vaxelaire, Chairman of the Exhibition Reception and

Information Committee, has stated that it is the aim of his group not only to make the exhibition unforgettable but to give visitors a lasting impression of "a veritable festival of hospitality" throughout his country. Belgium is to be at her best. A nationwide campaign of beautification has been undertaken. Flowers are to bloom on all sides. Public buildings are to be decorated. Special regional attractions are being planned.

This is not all. Part of the master plan for the exhibition is a campaign to promote the study of foreign languages among Belgians (many of whom already speak at least two tongues) so that visitors from abroad will experience no difficulty in making themselves understood. Lessons will be given in schools and on the radio, by correspondence and private tuition. When the exhibition opens, Belgians who speak several languages will wear badges indicating for the benefit of foreigners what languages they speak.

A plan for the "adoption of towns" by Belgian communities is to go into effect before the end of this year. Each of those taking part will establish contact with a town in an adjacent country and next summer a delegation of Belgians will be sent

IN MONTREAL



Men of affairs naturally stop at the WINDSOR because of its reputation for dignified comfort, unobtrusive, courteous service and its convenient location — and because the WINDSOR is recognized as the proper place for business and social meetings.

THE WINDSOR
ON DOMINION SQUARE

MAXIME RAYMOND, Q.C., President

to each "adopted" community from its sister-town in Belgium to extend an invitation to the exhibition and generally assure the members of the foreign centre of a warm welcome in Brussels.

Guides, hostesses and members of the exhibition staff will be carefully selected after taking special tests (described as "psychotechnical") and will be given training to prepare them for their duties. A pocket guide-book in four languages is to be issued containing maps, plans, routes lists of customs and tourist offices, museums and monuments, information about hotel rates, and so on. There will also be a booklet containing information about postal and exchange rates, a phrase book listing words in common use, a folder showing routes to the exhibition, and a motorists' map of Belgium showing the main highways and principal regions and their attractions, a hotel guide book, and similar publications.

When the exhibition opens in April 1958, there will undoubtedly be the usual array of flags and bunting, and the usual torrent of speeches and advertising. But long before then the unusually thoughtful approach of those who are planning it should lay a foundation for something unique: the foreigner met with courtesy, beauty and a sincere effort to bridge the chasm of language cannot feel himself a stranger and must respond in a sympathetic manner.

Austria Abolishes Visas for Canadians

Canadian citizens visiting Austria for a period of less than three months are no longer required to obtain visas. A valid passport is the only document needed. Those who wish to remain longer than three months, if they know their plans in advance, may obtain an extension from the Austrian Legation in Ottawa; otherwise, they may make arrangements in Austria.

Candide in New York

In New York this November a musical adaption of Voltaire's *Candide* will be presented for the first time. It will be staged by Tyrone Guthrie. The script has been written by Lillian Hellman, the music by Leonard Bernstein. John Latouche, Dorothy Parker and others are responsible for the lyrics. The costumes have been designed by Irene Sharaff. Ethel Linder Reiner is the producer. Information about tickets may be obtained from The Voltaire Company, 58 West 57th Street, New York 19, U.S.A.

T.C.A. Plans for Tomorrow

It has been announced that Trans-Canada Air Lines has purchased four DC-8 jet transports, costing almost \$28,000,000. The aircraft, when delivered in 1960, will be used on the regular service of the airline. They will be capable of carrying 120 passengers and three tons of cargo and will cruise at a speed of about 550 miles an hour at an altitude of 35,000 feet. It will be possible to travel from Montreal to London, England on them in about six hours, and from Toronto to Vancouver in about four hours. They are expected to have accommodation for both first and tourist class passengers.

Cunard Winter Cruises

The Cunard Steam-ship Company Limited has announced that its new liner, the 22,000-ton *Carinthia*, will make a 14-day cruise to the West Indies and South America this winter. She is scheduled to sail from New York on 22 December. The ship will call at Martinique, Trinidad, La Guaira, Curaçao, Cristobal and Port-au-Prince. Rates for this cruise start at \$350.

The veteran liner, *Mauretania*, will leave New York on the same date for a 29-day cruise to Rio de Janeiro and the West Indies. Her itinerary includes Port-au-Prince, Curaçao, La Guaira, Bahia, Rio de Janeiro, Trinidad, Barbados, Martinique, St. Thomas and Nassau. The minimum fare is \$750.

On 25 January 1957 the liner *Britannic* will leave New York on her eighth successive cruise to the Mediterranean. The cruise will last sixty-six days and the ship will call at Funchal, Casablanca, Tangier, Valletta, Haifa, Larnaca, Rhodes, Istanbul (after a cruise up the Bosphorus), the Dardanelles, Athens, Dubrovnik, Venice, Messina, Naples, Villefranche, Barcelona, Palma, Algiers, Malaga, Gibraltar, Lisbon, Cherbourg and Southampton. Cruise fares, which begin at \$1,275, include trans-Atlantic passage.

Montreal Convention Brochure

The Montreal Tourist and Convention Bureau has issued an attractive new edition of its brochure, *Montreal*, designed primarily to encourage groups to hold conventions in the city. The booklet, which measures eight and one-quarter by ten and three-quarter inches, is well illustrated with photographs and sketches and is printed on glossy coated paper. Written in three languages — French, English and Spanish — it contains notes about the history of the city,

(Continued on next page)



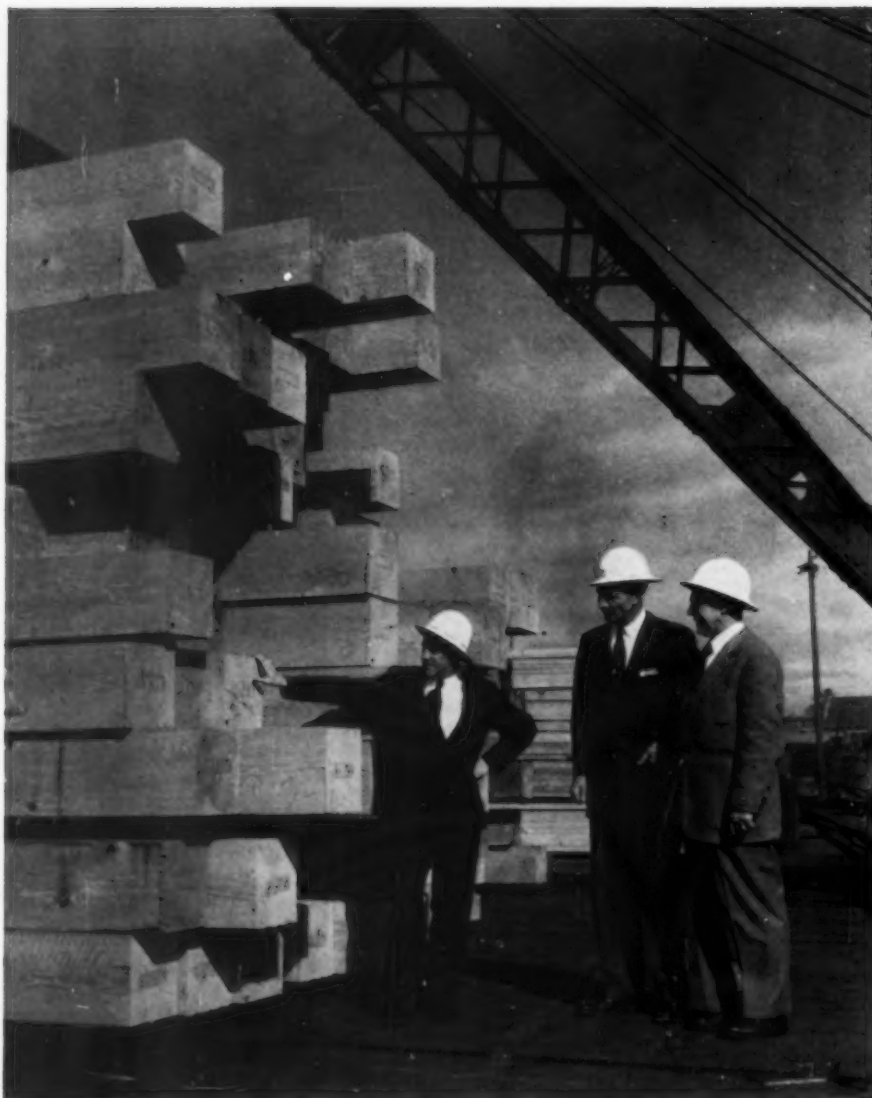
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working with Canadians in
every walk of life
since 1817



Royal Bank Manager Sees West Coast Lumber Moving To Overseas Markets

By talking to lumbermen on their own ground — or docks, in this case — the Royal Bank manager (centre) gets valuable first-hand insight into their operation, and the woods industry as a whole.

It is insight that cannot be gained just sitting at a desk. That is why he — and all Royal Bank branch managers — try to get out occasionally to see for themselves just what is going on in local industry. And that is why, over the years, he accumulates a wide fund of business knowledge that enables him to talk to his customers on a practical, constructive basis.

You will find your local Royal Bank manager well posted, and ready to dig for additional information when you need it. His value to you goes much further than the routine handling of your banking affairs. He'd like to meet you.

THE ROYAL BANK OF CANADA

A big bank serving a big country

(Continued from previous page)

its physical characteristics, shopping places, parks, amusement centres, industries, cultural life, summer and winter sports, shops, hotels and transportation facilities. In the back half of the booklet there is information about hotel accommodation and rates in Montreal and the Laurentians, an alphabetical list of business firms in the city, a calendar and list of public holidays for the years 1957-1960, and a map of the central section of the city. Copies of the brochure may be obtained from the Montreal Tourist and Convention Bureau, 1455 Peel Street, Montreal, Canada.

Canadian International Air Show

The Canadian International Air Show will take place 6-7 September this year at the Canadian National Exhibition in Toronto. It is sponsored by the Toronto Flying Club. Aircraft from five countries — United States, Great Britain, France, Czechoslovakia and Canada — will be exhibited. It is hoped that these will include the USAF six-jet Boeing B-47 bomber, R.A.F. Hawker Hunters and the Russian TU-104, a twin-jet transport. The "flying manhole cover", a one-man flight platform that has received much publicity in recent months, may also be displayed.

* * *

EDITOR'S NOTE-BOOK

Lyn and Richard Harrington (*The Mackenzie Highway Leads Down North*) are a husband and wife team whose articles and photographs have appeared in many Canadian publications and who have frequently contributed to the *Journal*. Their descriptions and photographs have brought many parts of the nation into vivid focus for those unable to follow their footsteps across the land.

* * *

Dr. T. M. Stevenson (*Grass — the Foundation of Agriculture*) is Chief of the Forage Crops Division, Department of Agriculture, Ottawa. He is also Dominion Agrostologist — that is to say, a specialist in the study of grasses. Dr. Stevenson received his education at the Universities of Saskatchewan and Minnesota. Prior to his appointment to his present post in 1938, he was engaged in research.

* * *

Lieutenant-Colonel E. M. D. Leslie, D.S.O., C.D., (*In South-west Arabia*) is on the General Staff of the Canadian Army and is stationed at

Army Headquarters in Ottawa. He was commissioned in the Regular Army in the Royal Canadian Horse Artillery in 1939 and served overseas in Europe during the Second World War. From 1951 until 1955 he commanded the First Regiment, Royal Canadian Horse Artillery in Canada and Korea.

* * *

Dr. Will R. Bird (*Yesterday is Up the Hill*), who lives in Halifax, is a well-known Canadian author. He has written several books and many magazine articles and short stories, and has given numerous public lectures. He is a former president of the Canadian Authors' Association and at present is Chairman of the Nova Scotia Historical Sites Advisory Council.

* * *

Brainerd S. Bates (*Majorca, Golden Isle of the Mediterranean*) is a freelance writer who spent three or four years in Majorca. He recently returned to the United States. Mr. Bates is fond of travel and specializes in articles about the places he has visited.

* * *

D. R. King (*Big Rock*) lives at High River, Alberta, not far from Okotoks, the town mentioned in his article. He is a freelance writer who takes a special interest in local history.

CANADIAN ASSOCIATION OF GEOGRAPHERS SIXTH ANNUAL MEETING

The Canadian Association of Geographers has members drawn from university life, the school teaching field, and professional geographers in government and business. They meet annually at the same time as the other Learned Societies to discuss their mutual problems and present papers outlining current geographical research. The sixth annual meeting was held at the University of Montreal 6-8 June. It was preceded by a meeting of the twelve-man executive, drawn from all parts of Canada.

The business meeting of the first morning was chaired by the president of the association, Dr. J. Lewis Robinson, University of British Columbia. It was reported that membership in the association totalled 140, including full, associate and student members. The association had given about 600 complimentary copies of its publication *The Canadian Geographer* to members of the American Association of Geographers who met in Montreal at Easter. Book prize awards were given to graduating geography students for outstanding essay in five universities. The Geography Education Committee prepared information on sources of illustrative material for geography teachers and planned to distribute this during the summer. Teachers of geography are encouraged to write to the membership chairman, Mr. Keith Fraser, Geographical Branch, Ottawa, for information concerning membership in the association.

During the afternoon of the first day papers were presented in French on rural population trends in parts of Quebec, and on the economic development on the south shore of the St. Lawrence estuary. Later in the afternoon a panel discussion on "The Teaching of Geography" was led by Professor Theo Hills of McGill University. In the evening at a joint meeting with the Geographical Association and *La Société de Géographie de Montréal*, Dr. Robinson gave his presidential address on "Geography and Regional Planning".

On the second day of the meeting, papers in the morning were concerned with physical geography, and dealt mainly with Northern Canada (Resolute Bay, Mackenzie delta and central Labrador) and with drainage terminology in Quebec. During the afternoon session on the topic of urban geography there were papers on suburban Vancouver, Edmonton, Toronto, Montreal, and St. John's. On the third day, Dr. Pierre Dagenais of University of Montreal led a field trip to several industrial plants in Sorel.

The meetings and work of the association should be of interest to all Canadians who are interested in geography, for this young group is trying to raise geographical standards and encourage geography in both the teaching field and at the professional employment level. President of the association this year is Dr. Pierre Camu, formerly of the federal Geographical Branch and now at Laval University. The important position of editor of *The Canadian Geographer* is held by Dr. Norman Nicholson, Acting-Director of the Geographical Branch in Ottawa.

AMONGST THE NEW BOOKS

The North American Midwest — A Regional Geography

Edited by: John H. Garland

(John Wiley and Sons Inc., New York, \$8.00)

This regional study of the heart of North America is the result of a collaboration of fifteen American geographers. The area included within the Midwest is, in general, the valleys of the Ohio, Upper Mississippi, Upper Missouri and Upper St. Lawrence Rivers. Within this vast region are all or part of eighteen states of the American Union and a small part of the Province of Ontario. As defined by the authors, the area is "home" to

(Continued on next page)

NOTICE

The International Union of Geodesy and Geophysics will hold its Eleventh General Assembly at the University of Toronto, Toronto, Canada, from 3 September to 14 September 1957.

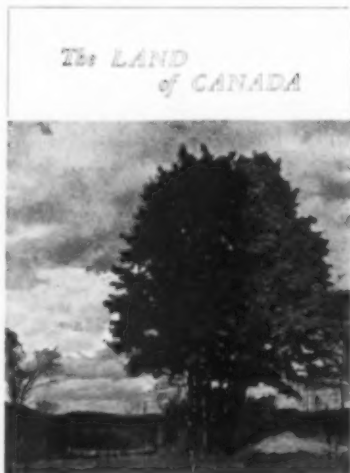
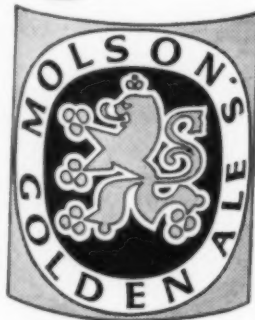
A circular has been prepared giving some preliminary facts about accommodation, travel, and entertainment. A limited number of these circulars are still available and may be obtained on request from the Public Relations Branch, National Research Council of Canada, Sussex Drive, Ottawa 2, Canada.

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(Continued from previous page)

nearly one-third of the inhabitants of the United States and Canada.

The editor places great importance on the region. "It is, perhaps, the most important single region in North America and one of great significance in the future of the Western World." The authors do not look outward from the region in their treatment of the subject but look inwards at the region itself.

Subject matter of the region is looked at both systematically and regionally. In Part II of the book, which gives the systematic study, the elements considered are weather and climate, settlement forms and patterns, significance of agriculture, structure of industry, and trade and transportation. It should be of more than passing interest to many geographers that in the systematic discussion such familiar topics as land forms, soils and drainage are omitted.

Part III of the book deals with four regions that make up the inner Midwest. Part IV is devoted to six further regions which are described as the Midwestern periphery.

The book would have been better titled the Midwest of the United States of America. Although south-

western Ontario and the Lakehead-Rainy River area are included in the region, they are given slight consideration. To write off south-western Ontario in approximately one page is to dismiss the area almost entirely. This reviewer feels that more attention could have been paid to the Canadian components of the region. If the authors did not feel this area warranted more space, it would have been better to have omitted it completely.

The book is well illustrated with maps. No photographs have been included. It is an unfortunate feature of a book written by several authors that the quality of writing varies widely from chapter to chapter. There are also cases within the book where the English could have been improved.

Although this book fills a useful purpose in bringing together in one volume a body of material upon an important segment of the North American Continent, it somehow fails to give the reader a picture of the region. Probably its most serious flaw is the lack of a final summarizing chapter that would bring all the material into proper perspective.

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Arctic Research

(Edited by Diana Rowley)

(Arctic Institute of North America,
Special publication No. 2.)

This solid and useful volume covers a wide range of subjects and contains papers by many who are authorities in their fields.

In addition there is an imposing list of field and library research projects that have been sponsored by the Arctic Institute of North America, and a good folding map of the North American Arctic. The enormous task of editing and presenting all this varied material has been admirably performed by Diana Rowley.

In an introduction written shortly before his death in 1955, Dr. R. C. Wallace, Executive Director of the Arctic Institute, describes the purpose of the volume as a review of the status of scientific research in the North American Arctic, with especial emphasis on present trends and future needs. By pointing out some of the more pressing and interesting problems awaiting study the Institute hopes to show the way for young scientists in search of a project. This is a worth-while aim, and there is plenty of stimulating material in many of the papers, although some of the fields discussed are by their nature more suitable for development by government or other large agencies than by individual workers. The volume fulfils another valuable purpose in that it provides scientists with a review of work being done in fields other than their own, something that is increasingly important in these days of ever narrowing specialization. This point is touched upon by Hugh M. Raup in his paper on botanical problems, where he talks of the decline of the "correlative thinking in the natural sciences" which was the strength of the broadly trained naturalists of earlier, simpler days.

No attempt has been made, wisely, to guide the contributors in their approach to their subjects, or to standardize the areas discussed. Some papers deal with the whole North American Arctic, some with Alaska or Canada only, and some, rather too few, with Greenland. The quality of the papers is somewhat uneven. It is impossible for one person to judge the whole range of subjects, but this reviewer, for instance, would have liked to see more detail in the oceanographic paper and more specific suggestions for future studies in sea ice.

It is inevitable that this volume should invite comparison with the American Geographical Society's *Problems of Polar Research*, published in 1928, which has become such a

classic of polar literature. The present book is much shorter and covers a smaller area but a rather wider range of subjects. It seems at first reading to contain less new and original thinking, but the comparison is perhaps unfair, because in 1928 known facts were comparatively few and it was a time for broad concepts and speculation, whereas now, with improved transportation and other facilities, we have entered into a fact-finding phase which is very important but which is bound to be in some ways more humdrum. The Arctic Institute is to be congratulated on producing an interesting volume which it is to be hoped will stimulate a wider interest in arctic research.

MOIRA DUNBAR

* * *

The Mysterious North

by Pierre Berton

(McClelland, Stewart, Toronto, \$5.00)

Although there is a large and rapidly growing library on the Canadian north, there has remained a gap which few have had the ambition to fill, and which no one has bridged as successfully as Mr. Berton. This is the kaleidoscopic view of the entire north touching on people, times and places as remote from one another as the Eskimos of Baffin Island, the gold rush of the Klondike and the modern iron mines of Ungava.

Other books may better survive the years. Some are more scholarly, more introspective. Many tackle the problems of some sector of northern life with the intimacy and authority which only a lifetime of residence can grant. None come close to projecting personal enthusiasm for every sector of life in the northern third of Canada.

Pierre Berton was the man to

undertake the task. He was born in the north — in Whitehorse — and among the fabled creeks of the Klondike he developed a curiosity and an imagination which have extended far beyond the Yukon. Many people have succumbed to the fascination of northern living, but few have had the skill and training to translate it into an absorbing travelogue for others.

The Mysterious North is a travelogue, with all its shortcomings and virtues. The little details of continuity in aircraft boarded and in passenger lists seem trivial and sometimes even irritating in relation to the immensity of the backdrop. But this is a reasonable price to pay for the infinite variety of the scene, and on at least one trip — down the Alaska Highway — the account of the vehicle and a driver addicted to high speed and comic books gives a flavour with which no scenery could compete. Mr. Berton has a feeling for people and despite an unease in the recording of dialogue, he expresses much of the north through its residents. The reader may sometimes have the impression that the north is full of characters, but in all likelihood that is the impression Arctic inhabitants have of the south. It will be a pity if the boundaries of knowledge are pushed back in either direction to the extent that the people on the other side become wholly believable.

Mr. Berton is one of the few writers on the north who has resisted the temptation to elaborate on what the main vested interests — the administration, traders and missionaries — have done for, or to, the country. There is a depth of feeling for the trappers of the Mackenzie

(Continued on next page)



Fishermen who begrudge the effort involved in catching live crickets for bait can buy a quart of them, by mail, from a Georgia cricket farm.

We learn that it takes fifteen days for cricket eggs to hatch, eight weeks for the insects to grow to bait size. We note, too, that the brooders where they laze about in 85° temperature, lapping up chicken mash, are made of aluminum. But we confess we're not too surprised. It simply means that this busy metal has found still another use in the busy housing industry — this time providing clean, warm, pleasant quarters for aristocratic crickets. You see aluminum everywhere these days!

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(Continued from previous page)

Delta or the changing role of the Eskimos, but the problems are recorded by a reporter rather than by a sociologist or a local expert. In his reporting Mr. Berton is sometimes capable of handling the English language in a manner which might qualify him for the vacant title of poet of the northland. Unfortunately, the level is not sustained. It may have been a lack of discipline, for the book gives evidence of being edited against a background of waiting presses rather than of being a timeless document. Or it may have been Mr. Berton's own rampaging enthusiasm which, having allowed him to photograph in his mind the beauty of, say, Baffin Island, does not permit him to tarry over it while there is a waiting aeroplane or a waiting yarn.

Vast enthusiasm and journalistic skill have not produced the final book on the north, but they have given us the sort of sweeping introduction which will make Mr. Berton the envy and delight of many a fireside traveller.

R. A. J. PHILLIPS

* * *

The British Moorlands

by John Fraser Hart

(University of Georgia Press.
Athens, Georgia, \$2.00)

Sometimes it is difficult to imagine how nearly 50,000,000 Britons can squeeze onto their tiny island. One might think that there must be one continuous city running the length and breadth of the kingdom, with people on the edges spilling into the seas. This is not so. Of many riddles that face the visitor to Britain, one of the most puzzling is the wealth of wasted land.

There are parts of the country so desolate, so isolated, that the traveller there might as well be in the heart of a desert. Perhaps puzzled by this, John Fraser Hart of the University of Georgia has written a book about the way the land is used. He has called it *The British Moorlands — A Problem in Land Utilization*, a title which hardly indicates the vivid interest of the book itself. Mr. Hart's work is stimulating. The British need land.

Are they making the most of what they have? This is the question asked by Mr. Hart. He sees a situation, outlines it well, and energetically sets about finding a solution.

Britain is short of land, yet research proves that much of what does exist is sadly wasted. Some lies idle, more is only half-used. For example, the moorlands serve varied purposes: some are afforested; others are used as recreation areas for townspeople or training areas for troops, but principally they are used for agriculture. There is a tendency, Mr. Hart notes, to devote more land, and better land to this than is necessary.

He suggests that the moorlands (mostly on high ground, and relatively barren) be brought far more into play. If certain types of agriculture were moved further uphill, for example, instead of wasting rich valley soil, the better land could be used to more advantage. Similarly, troop-training grounds (of which there are many) could be moved to inaccessible areas in which the soil is poor. Where possible, the moorland should be used for the secondary purposes of good earth. Also, where possible, the separate functions that the land serves should be united. Areas reserved for recreation, for instance, could well be combined with areas used for supplying water to the towns. One piece of land could do the job now being done by two. These are two of many concrete proposals made by Mr. Hart.

He believes two things are vital: to obtain more financial support from the Government for the moorlands, and to educate landowners as to the ways in which their land affects the nation.

In addition to providing a clear picture of the use of land in the Great Britain, the author tells the story of what has been done, and what is now being done to preserve and increase the efficiency of the land. This book could serve as a guide to men who face similar problems in other countries, and as a signpost to the men who shape the land patterns of Great Britain.

JAMES PILDITCH



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